





HAND-BOOK

OF

NORTH CAROLINA,

Dept. of agriculture.

WITH

MAP OF THE STATE.

PRINTED BY ORDER OF THE BOARD OF AGRICULTURE.

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CONTENTS.

	PAGE.
GENERAL SKETCH.....	1
EASTERN SECTION.....	6
MIDDLE AND PIEDMONT SECTION.....	22
WESTERN SECTION.....	35
GEOLOGICAL FORMATION.....	46
PEOPLE OF THE STATE.....	52
GOVERNMENT AND TAXATION.....	55
EDUCATION	59
RELIGION	63
STATE DEBT.....	63
PUBLIC INSTITUTIONS.....	65
DESCRIPTIONS OF COUNTIES.....	67
ALAMANCE	120
ALEXANDER.....	128
ALLEGHANY.....	133
ANSON	107
ASHE	133
BEAUFORT	75
BERTIE.....	85
BLADEN	99
BRUNSWICK.....	82
BUNCOMBE.....	138
BURKE	130
CABARRUS	111
CALDWELL	129
CAMDEN.....	68
CARTERET	78

	PAGE.
CASWELL	121
CATAWBA	113
CHATHAM	105
CHEROKEE	145
CHOWAN	71
CLAY	144
CLEVELAND	116
COLUMBUS	83
CrAVEN	77
CUMBERLAND	95
CURRITUCK	67
DARE	72
DAVIDSON	109
DAVIE	124
DUPLIN	94
DURHAM	105
EDGECOMBE	88
FORSYTH	124
FRANKLIN	101
GASTON	115
GATES	83
GRAHAM	143
GRANVILLE	102
GREENE	89
GUILFORD	118
HALIFAX	86
HARNETT	96
HAYWOOD	140
HENDERSON	139
HERTFORD	84
HYDE	74
IREDELL	112
JACKSON	141
JOHNSTON	91
JONES	78
LENOIR	93

	PAGE.
LINCOLN	114
MCDOWELL.....	131
MACON	142
MADISON.....	137
MARTIN.....	90
MECKLENBURG	112
MITCHELL.....	135
MONTGOMERY	106
MOORE	97
NASH.....	87
NEW HANOVER.....	81
NORTHAMPTON	85
ONSLow	79
ORANGE.....	104
PAMLICO	76
PASQUOTANK	69
PENDER.....	80
PERQUIMANS.....	70
PERSON	120
PITT.....	89
POLK	132
RANDOLPH	118
RICHMOND.....	98
ROBESON	98
ROCKINGHAM	122
ROWAN.....	110
RUTHERFORD.....	117
SAMPSON	94
STANLY	108
STOKES.....	123
SURRY	126
SWAIN	143
TRANSYLVANIA.....	139
TYRRELL.....	73
UNION	107
VANCE.....	103

	PAGE.
WAKE	103
WARREN	100
WASHINGTON	73
WATAUGA	134
WAYNE	92
WILKES	127
WILSON	91
YADKIN	125
YANCEY	136
MINERALS.....	146
IRON ORES.....	146
Of the East	146
Halifax and Granville.....	147
Johnston and Wake.....	148
Chatham and Orange.....	148
Person	153
Montgomery and Randolph.....	153
Guilford	154
Mecklenburg and Cabarrus	155
Gaston, Lincoln and Catawba.....	156
Yadkin, Surry and Stokes.	161
Burke, Caldwell, &c.....	162
Mitchell and Ashe.....	165
French Broad.....	167
Cherokee.....	168
COAL.....	169
Deep River Coalfield	170
Dan River Coalfield.....	174
GOLD.....	175
COPPER	176
SILVER, LEAD, ZINC.....	178
OTHER USEFUL MINERALS.....	179
Mica	179
Corundum.....	180
Chromic Iron.....	180
Manganese	181

	PAGE.
Kaolin	181
Fire Clay..	182
Agalmatolite	183
Whetstone	183
Millstone and Grindstone.....	184
Graphite.....	185
Limestone.....	186
Marble	188
Talc.....	188
Serpentine.....	189
Baryte	190
Marls.....	191
Peat and Muck	194
Asbestos	194
Soapstone.....	195
Pyrite.....	195
BUILDING STONES.....	196
PRECIOUS STONES.....	197
Diamond	197
Beryl.....	198
Zircon.....	199
Garnet.....	199
Agate.....	200
Opal.....	201
Hiddenite.....	201
Emerald....	202
Ruby	203
Sapphire.....	203
MINERAL WATERS.....	204
MINING IN 1885.....	205
Warren, Franklin, Nash.....	207
Moore.....	211
Montgomery.....	217
Randolph	224
Stanly.....	229
Union.....	232

	PAGE.
Davidson.....	236, 248
Guilford.....	246
Rowan.....	249
Cabarrus.....	256
Mecklenburg.....	260
Gaston.....	267, 283
Lincoln.....	269
Catawba.....	270
Davie.....	271
Ashe.....	272
Caldwell.....	272
Burke.....	273
McDowell.....	273
Rutherford.....	273
Cleveland.....	273
Polk.....	279
Granville.....	280
Person.....	280
MANUFACTURES.....	286
MANUFACTURING FACILITIES.....	286
COTTON FACTORIES.....	293
WOOLLEN MILLS.....	299
TOBACCO FACTORIES.....	301
MANUFACTURES OF WOOD.....	302
IRON MANUFACTURES.....	304
PAPER FACTORIES.....	305
FLOURING AND GRIST MILLS.....	306
RICE MILLS.....	307
FERTILIZER FACTORIES.....	308
PINE LEAF FACTORIES.....	310
MILL STONES.....	311
COTTON SEED OIL MILLS.....	312
FISH OIL MILLS.....	338
AGRICULTURE.....	314
FARM AREAS AND CLASSIFICATION.....	314

	PAGE.
AGRICULTURAL POPULATION	319
AGRICULTURAL SOCIETIES AND FAIRS.....	319
ENSILAGE.....	320
PRINCIPAL PRODUCTS.....	321
WOODS AND TIMBERS.....	328
TAR, PITCH AND TURPENTINE.....	329
SILK CULTURE.....	331
FISHING INTERESTS.....	334
THE OYSTER SURVEY.....	336
GERMAN CARP.....	338
FISH OIL MILLS ...	338
NEWSPAPERS	342
COMMERCIAL FACILITIES.....	347
RAILROADS.....	347
WATERWAYS	349
REAL AND PERSONAL PROPERTY—folding leaf after	349
POPULATION	350
MAP OF NORTH CAROLINA.....	

GENERAL SKETCH.

The State of North Carolina is bounded on the north by Virginia, east by the Atlantic Ocean, south by South Carolina, and west by Tennessee. It is included nearly between the parallels 34° and $36\frac{1}{2}^{\circ}$ north latitude, and between the meridians $75\frac{1}{2}^{\circ}$ and $84\frac{1}{2}^{\circ}$ west longitude.

The extreme length of the State from east to west is $503\frac{1}{4}$ miles; its average breadth is 100 miles; its extreme breadth is $187\frac{1}{2}$ miles. Its area embraces 52,286 square miles, of which 48,666 is land, and 3,620 is water.

Its topography may be best conceived by picturing to the mind's eye the surface of the State as a vast declivity, sloping down from the summits of the Smoky mountains, an altitude of 7,000 feet, to the level of the Atlantic Ocean. The Smoky mountains constitute a part of the great Appalachian chain, which here attains its greatest height; the greatest, indeed, in the United States, east of the Rocky mountains. This slope is made up of three wide extended terraces—if that term may be allowed; the first a high mountain plateau—distinguished as the Western or Mountain Section; the second, a submontane plateau, distinguished as the Middle Section, of which the western half is further dis-

tinguished as the Piedmont Section; the third, the Atlantic plain, distinguished as the Low Country or Eastern Section, and that part from the head of the tides downward as the Tide-water Section. From the first to the second section there is a sharp descent through a few miles only of not less than fifteen hundred feet; from the middle to the low country a descent of about two hundred feet; through the two latter, however, there is a constant downward grade.

The State is traversed by two ranges of mountains. The first, the Blue Ridge, a grand and lofty chain, which, conforming to the trend of the Smoky mountains and that of the coast line, runs in a direction N. E. and S. W. entirely across the State. The Brushy and the South mountains are bold offshoots of this chain. The second, the Occoneeche and Uwharrie mountains, a range of much inferior elevation—whose rounded summits and sloping outlines present themselves in forms alike graceful and pleasing—crosses the State in a parallel direction near its centre.

The State is watered by numerous rivers, many of which have their rise on the flanks of the Blue Ridge. Those which flow west empty into the Mississippi, breaking their way through the Smoky mountains, plunging headlong for miles through chasms from three to four thousand feet in depth, the walls of which are perpendicular to the height of one thousand feet. Some of these gloomy passages have seldom been explored; no boat could live in such a current, and it is hard to

find a foothold along the sides. Of those which rise on the eastern flank only one, the Roanoke, reaches the sea within the borders of the State. The rest, following the line of the softest rock, meander first towards the northeast, then sweeping round with bold curves, flow to the sea through South Carolina. The principal rivers which reach the sea within the State limits take their rise in the northern part of the Middle Section, and on the eastern flank of the Ocoaneeche range near its northern termination, and of these only one, the Cape Fear, flows directly into the ocean. Many of the rivers in every part of the State are noble streams in their middle course; some of those that flow into the sounds swell to majestic proportions, spreading out to a width of from three to five miles. The eastern rivers are navigable from fifty to one hundred and fifty miles.

By reference to the mean parallels of latitude of the United States it will be seen that North Carolina is situated nearly midway of the Union; and inasmuch as those States lie entirely within the temperate zone, it follows that North Carolina is situated upon the central belt of that zone. This position gives to the State a climate not excelled by any in the world. She is exempt from the extreme cold which prevails in the Northern States, and to a considerable extent from the early frosts which visit the States immediately north of her, on the one hand; and from the torrid heat and malarial influences which prevail in the States to the south of her on the other. Other causes apart from its position concur to

produce this result. On the west the lofty Appalachian chain interposes its mighty barrier between the bleak winds of the northwest and the general surface of the State. On the east the coast is swept by the Gulf Stream, the meliorating effect of which is felt far inland. From these causes combined the temperature of the seasons ranges within moderate limits. The Spring comes in with less of those fickle variations which mark its advent elsewhere on this continent. The Summers are not oppressive, even in the low country, or if so, for a few days only. But in the Autumn nature here exhibits herself in the most benignant mood in her most favored zone. From the incoming of October to the latter part of December, there is an almost uninterrupted succession of bright, sunny days, during which the air is dry, crisp and pure—a season equally favorable to the ingathering of the crops and to active exertion of every kind. The reign of Winter as respects cold and wet is short, and field labor is carried on throughout that season, with the exception of two or three days at a time. Frost makes its appearance about the fifteenth of October, and sometimes there is not enough to nip the tender vegetation until the end of November. From the Blue Ridge to the seaboard, ice rarely forms of a thickness to be gathered except in localities overhung and deeply shaded by high southern bluffs. When snow falls it covers the ground for only a few inches, and is quickly dissipated by the sun. Fogs are of rare occurrence, and then mainly in the form of a belt of light

vapor marking the course of the larger streams in the latter part of Summer and during the Autumn months. The average rainfall throughout the State is fifty-three inches, which is pretty uniformly distributed through the year.

Prof. Kerr, in his Geological Report, classes the climate of the different sections of North Carolina with reference to their isothermal ranges, as follows: "Middle and Eastern North Carolina correspond to Middle and Southern France, and Western North Carolina to Northern France and Belgium. And all the climates of Italy, from Palermo to Milan and Venice, are represented."

The following tables computed by Prof. Kerr, partly from observations taken in all sections of the State for a term of years, and partly from Blodgett, will show the range and character of the climate better than any description :

Mean annual temperature for the State.....	59°	Far.
“ summer “ “	75	
“ winter “ “	43	
“ rainfall “ “	45	inches.

MIDDLE SECTION.

Raleigh, N. C.....	60°	76°	44°	48°
Florence, Italy	59	75	44	27

EASTERN SECTION.

Beaufort, N. C. (on the coast).....	62°	78°	46°
Genoa, Italy.....	61	75	47

Smithville, N. C. (Sea Coast).....	66°	80°	51°
Mobile, Ala.....	66	79	52
Nicolosi, Sicily.....	64	79	51

WESTERN SECTION.

Asheville, N. C. (In the Mountains).....	54°	71°	38°
Venice, Italy	55	73	38
Bordeaux, France.....	57	71	43

Thus, he says, "it will be seen that the range of climate in the State is the same as that from the Gulf of Mexico to New York. The influence of this circumstance is seen in the wide range of natural and agricultural products, from the Palmetto and Magnolia grandiflora to the White Pine, Hemlock and Balsam Fir, and from the sugar cane and rice to Canadian oats and buck-wheat."

For a thorough understanding it will be necessary to take a survey of the different sections more in detail. It has been seen that the divisions of the State are founded on natural and physical peculiarities.

Eastern Section.

The whole eastern portion of the State belongs to the quaternary system, with frequent exposure along the rivers, ravines, and ditches of the eocene and miocene epochs of the tertiary. It consists of a vast plain, stretching from the sea coast into the interior of the

country, a distance of from one hundred to a hundred and twenty-five miles. Traversing this section from north to south are tracts of country which vary little from a perfect level. The Wilmington and Weldon Railroad has a stretch of forty miles where there is neither curve, excavation nor embankment. From east to west the surface rises by easy gradations at the rate of a little more than a foot to the mile. The rise, however, is not perceptible to the traveler. But though level in parts, it is in general relieved by slight undulations. In its extreme western part, in the county of Moore, it attains an elevation of above five hundred feet.

The western boundary may be roughly defined by a line extending from the western part of Warren, through Franklin, Wake, Cumberland, Chatham, Moore, Montgomery and Anson. This line marks what, at an early period of the earth's history, was a line of sea beach. Over this whole section the primitive rocks are covered with a deep stratum of earth, principally sand. Along the western border there is a broad belt of unequal width, but generally from thirty to forty miles across, where granite, slate and other rocks are sparingly distributed: they are also found near water-courses in the interior of this section. The belt of primitive rock here mentioned extends to the Wilmington and Weldon Railroad, from the Virginia line to Goldsboro, and from thence to a line drawn through Averagesboro to the South Carolina line about

where the Pee Dee enters that State. From the line there indicated to the sea coast, not a stone of any size, scarcely a pebble, except at a few points, is to be met with. There is a rock peculiar to this section formed by the combination of the calcareous element of sea shells, and the silicious matter of sand. It is full of cavities—the prints of decomposed shells—and is used to some extent as mill stones.

A bed of shell limestone underlies this part of the State, cropping out at intervals. It forms a good limestone, sufficiently pure for all the common purposes of building, and in quantity large enough to supply a wide extent of country with quicklime. Examples of this are found nine miles below Waynesboro, in the northwest corner of Jones, in the northern part of Onslow, at Wilmington, and on the northwest branch of the Cape Fear to a distance of forty miles above.

This section is made up of beds of clay and sand with vast quantities of shells imbedded in them. The soil varies in character to the extent that the one or the other predominates; and to the extent that the shells when intermixed with it, have undergone decomposition. The upland soil is for the most part a sandy loam, easily accessible to the sun's rays, easily worked, and very productive in the crops there cultivated. There are, however, extensive areas of country where sand predominates to such a degree that the surface to a considerable depth is a bed of white sand. Yet this kind of land is the favorite habitat of the long-leaf pine. When cleared

it yields good crops of corn and cotton for a few years without manure, and always with slight help from proper commercial fertilizers. There are other extensive areas where clay enters so largely into the soil as to form a clay loam. The counties on the north side of Albemarle sound—a very fertile tract of country—are examples of this class. The alluvial lands of this section—lands always in the highest degree productive from the fact that all the elements of fertility are intimately intermingled by having been once suspended in water—are of unusual extent and importance. The grain grown there supplies food not only for people of other parts of the State, but large populations in other States. There are also extensive areas where the shells of the eocene era of the tertiary formation—and which have been decomposed by time—crop out to the surface and impart to the soil a high degree of fertility. This is the case from the eastern part of Jones county to the Cape Fear. The greater proportion of the good lands in Jones depends upon the fact that this formation is largely developed there. The rich lands of Onslow, and of Rocky Point, in New Hanover, owe their excellence to the same cause. Another class of land in point of fertility equalling any in the world is that reclaimed from some of the lakes of this section. To two of these the process of drainage has been applied—Lake Mattamuskeet, and Lake Scuppernong (Phelps). By canals dug from the lake to the nearest stream which afforded the necessary fall a wide margin entirely round the lake has

been brought into cultivation. These lands seem to be absolutely inexhaustible. The cultivation of three quarters of a century has made no change in their productive capacity. To the lands reclaimed from the borders of marshes—so frequent near the sea shore—the same remark may be strictly applied.

Another class of land remains to be mentioned which will be a resource of inestimable value in time, perhaps not distant. Bordering on the sea and sounds are extensive tracts of country designated as swamps. Though so-called they differ widely in their characteristic features from an ordinary swamp. They are not alluvial tracts, neither are they subject to overflow. The land covered by many of them lies for the greater part quite low; but this remark seldom applies wholly to any of them—to some does not apply at all. On the contrary many of them occupy the divides or water sheds between the rivers and sounds, and are elevated many feet above the adjacent rivers of which they are the sources. These latter are susceptible of drainage, and when reclaimed have every element of the most exuberant and lasting fertility.* Bay river swamp, between Pamlico and Neuse rivers, and Green swamp in Brunswick and Columbus counties may be mentioned as examples. The elevation of the latter is forty feet above the sea level. The work of drainage is simple. From the border of the swamp which is always the highest land, the bottom slopes in every direction gradually, almost imperceptibly to the centre. A canal cut through this border into the swamp

and carried to some neighboring stream, lays bare an extensive belt along the entire border. The aggregate territory in the State known as swamp lands is between three and four thousand square miles. When drainage shall be properly carried out over this great territory—a work which, on account of the slight difficulties to be encountered as compared with those which they encountered and overcame, would be deemed trifling by the laborious North German and the indefatigable Hollander—hundreds of square miles of land of surpassing fertility will be added to the area now in cultivation.

Throughout this entire section cotton, corn, oats, sorghum, peas, potatoes, especially sweet potatoes, are the staple crops; the culture of tobacco has been lately introduced with success. Upon the rich alluvions and the reclaimed lake and swamp lands, corn, with peas planted in the intervals between the corn, forms the exclusive crop. Occasionally on the broad low-grounds of the Roanoke, wheat is grown to a considerable extent. In the counties on the north of Albemarle sound it is one of the staple crops. On the low-grounds of the lower Cape Fear rice has long been the staple crop, and during recent years its culture has been extended northward along the low lying lands of the rivers and sounds. The upland variety of rice has been introduced within a few years past with entire success. The cultivation of jute also has been the subject of experiment with like success, and it only needs proper encouragement to be grown to any extent. This section is everywhere un-

derlaid with marl—a mixture of carbonate of lime and clay formed by the decomposition of the imbedded shells—sufficient in quantity, when raised and applied to the surface, to bring it to a high pitch of fertility and maintain it so.

The only metallic substances that have been found within this section are some of the ores of iron; the bisulphuret, hydrated oxide, and sulphate, or copperas.

In the counties of Duplin and Sampson valuable deposits of phosphates have been discovered, which are now being mined and ground for fertilizing purposes. They are known to exist in the adjoining counties, but to what extent has not been yet ascertained. From the similarity of the geological conditions throughout the eastern section, there is little doubt that a systematic exploration there will lead to further extensive discoveries.

The use of marl, on account of its lower value in comparison with its bulk and consequent cost of transportation, must be mainly, if not wholly, confined to the section in which it is found. Phosphates, on the other hand, on account of their high fertilizing power, admit of transportation to any distance, and may be used anywhere.

Dr. Emmons remarks: “The swamp soils of North Carolina show a greater capacity for endurance than the prairie soils of Illinois, notwithstanding the annual crops are somewhat less per acre; and on the score of location we are unable to see that the Illinois soils have the preference. Nor, as regards health, are our swamp soils

more subject to malaria than the country of the prairies." He refers to the remarkable fact that, "persons live and labor in swamps with impunity or freedom from disease." This statement is fully sustained by the reports of our engineers who have had charge of the construction of railroads in that section.

The swamps, in their natural state, afford abundant pasturage. They are covered by a dense growth of reeds, which supply excellent food for cattle winter and summer.

That eminent agriculturist, Mr. Edmund Ruffin, of Virginia, who studied this section of the State with care, expressed a high appreciation of the tide-water region for the cultivation of grasses. He said: "There is no better country for grasses east of the mountains. In small lots I saw dry meadows of orchard grass and clover that would have been deemed good in the best grass districts." It is evident from the humid character of the climate in that region, and from the fact that the heats of summer are tempered by sea-breezes, owing to the proximity of the ocean, that the conditions are such as to favor the growth of this family of plants.

Among the resources for future use along the seaboard country, peat is entitled to a prominent place. It exists over hundreds of square miles in area, and to the depth of many feet. At no distant day it will be extensively used both as a fuel and fertilizer.

If the indications of nature are to be relied on, North Carolina was plainly marked out as the land for vine-

yards. In the sober narrative of the voyage of Amadas and Barlowe, made in 1584, to North Carolina, then an unbroken wilderness, the author tells us: "We viewed the land about us, being, where we first landed, very sandy and low towards the water side, but so full of grapes as the very beating and surge of the sea overflowed them, of which we found such plenty as well there as in all places else, both on the sand and on the green soil, on the hills as in the plains, as well on every little shrub as also climbing towards the tops of high cedars, that I think in all the world the like abundance is not to be found; and myself having seen those parts of Europe that most abound, find such difference as were incredible to be written." Upon the visit of the voyagers to the house of the Indian King, on Roanoke Island, wine was set before them by his wife. It is further mentioned that, "while the grape lasteth, they (the Indians) drink wine;" they had not learned the art of preserving it. Harriot, a distinguished man in an age of distinguished men, of whom it was justly said that he cultivated all sciences and excelled in all, visited the same coast in 1586, where he was struck with the abundance of grape vines, and he was impressed with the fact that wine might be made one of the future staples of the State. "Were they," he writes, "planted and husbanded as they ought, a principal commodity of wines might be raised." This State has proved to be far richer in this respect than it is probable even he suspected. Grape vines were found in equal profusion in the origi-

nal forest throughout the State. They often interlaced the trees to such an extent that they were a serious impediment to the work of clearing away the forest, catching and suspending the trees as they were felled. At this day, if a tract of forest is enclosed, and cattle of every kind excluded, they spring up spontaneously and thickly over the land. Some of the finest wine grapes of the United States, the Scuppernong, the Catawba and the Lincoln, are native to this State. But it was long before the bounty of nature in this regard was improved. This was probably due to the fact that the State was settled almost wholly by emigrants from the British Isles, who knew nothing of the culture of the vine. It was planted here and there to yield grapes for table use; but it was not until within thirty years that a vineyard was known in the State. Within that period several of large and a great number of small extent have been planted. Grapes in season are abundantly supplied for domestic consumption, and shipped in hundreds of tons. The wines of the established vineyards are held in high and just repute.

All the cultivated fruits and berries grow here in great perfection with the exception of the apple. This, though by no means an inferior fruit, is yet not equal in size and flavor to that of the Middle and Western sections. Among the swamps the cranberry is found in profusion. The melons are of every variety and of peculiar excellence.

An industry peculiar to this section is what is known as the "trucking business." It consists in rearing fruits and vegetables for the Northern markets. The principal centres are Goldsboro and Newbern; but it is probable that the farmers along the line of the Norfolk and Edenton Railroad will become successful competitors for this business. The essentials for success are found there—a fertile soil and quick transportation.

Each section of the State embraces a great number of trees, largely used in building and the domestic arts, not mentioned here; only those are here mentioned the timbers of which are exported beyond the State, or which have become the subject of extensive home industries. For a complete list of the timber trees of each section, the reader is referred to the table on a subsequent page. Some of them are known by different names; the botanical name is therefore added for the purpose of identification. The trees used for shade and for the adornment of pleasure grounds are omitted altogether.

In speaking of the timber trees of this section, the first place is due to the *long-leaf pine* (*Pinus australis*). It is the most valuable of all trees. Apart from its products—turpentine, tar, rosin and the spirits distilled from the turpentine—its uses in civil and naval architecture defy enumeration. The timber and its products were long, and are to-day, among the chief articles of export from this State. It alone has brought, and now brings, ships from every port of the world to Wilmington, the chief seaport town of the State. Considerable inroads

have been made upon these forests contiguous to railroads and navigable streams. A vast reserve, however, remains for the use of future generations; it still covers a wide area in this section.

The *cypress*, (*Taxodium distichum*), is next in importance. It is found everywhere in the swamps of the eastern part of this section. The axe has been diligently plied in the cypress forest for three-quarters of a century or more; its timber being among the most valuable for the frame and woodwork of houses, for shingles, for fencing and for water-pipes. Yet the margins of the swamps only have been cleared. Beyond this margin is an immense forest of these trees which has been scarcely encroached upon. Its height is from sixty to one hundred feet, with a circumference above its swollen base of from twenty to thirty feet—often much larger.

The *white cedar* (*Cupressus thyoides*), commonly called juniper, is also abundant in the swamps. For the many uses to which the timber of this tree is applied, as for building, for water vessels, &c., these forests have been as much cut into, and for as long a time, as that of the cypress; but the supply is inexhaustible. The tree is from seventy to eighty feet high, with a diameter of two to three feet.

The *live oak* (*Quercus virens*), so highly prized for ship building, is found all along our coast, though most abundant from Hatteras southward. It is commonly forty to fifty feet high, and one to two feet through the trunk.

Besides the present existing forest there are over large areas of the swamp lands, several successive generations of buried forests, the timber of which is in good preservation, ready to be exhumed when the growth now standing shall have been exhausted. These buried trunks of trees will in time be utilized here as they have been along the coast of New Jersey and Delaware.

The main-land terminates not at the sea, but at large bodies of water termed sounds. These sounds answer very slightly to the sense in which that word is employed by geographers. As employed by them the word *sound* designates a strait between the main-land and an isle, or a strait connecting two seas, or connecting a sea or lake with the ocean. These sounds are properly narrow seas. They are separated from the ocean by a barrier of sand called "The Banks," which stretches along the whole coast, except at Beaufort and at the mouth of the Cape Fear. Between these sounds and the ocean are a few narrow passes termed inlets.

The largest of these sounds are Pamlico and Albemarle; the former about seventy-five miles long, and fifteen to twenty-five miles wide; the latter in length about fifty, and in breadth from five to fifteen miles. These sounds abound in fish of the finest varieties, but the principal fishing stations are in Albemarle sound. The volume of water poured in at the head of this sound by the Roanoke and Chowan rivers renders its waters fresh, except at its eastern limit. Here the migratory fishes—especially the herring, shad and rock (bass)—

repair at the spawning season in such numbers as to rank it among the best fishing grounds on the Atlantic coast. The business is conducted with an enterprise, system and outlay of capital proportioned to its magnitude. The seines are from a mile to a mile and a quarter long, and are carried out and drawn in by steam power. From eighty to a hundred thousand and sometimes two hundred thousand and more are caught at a single haul. The shad and rock are packed in ice and exported to the Northern cities. The herring are cured in salt and stored in barrels for the home and distant markets. Along the southern coast of the State other varieties of fish are taken in great quantities. The mackerel, the mullet, the sheepshead, the trout, the blue fish and pig fish are among those most esteemed for their flavor. All kinds of shell fish are abundant and fine.

The sounds are the resort also of vast quantities of water fowl, notably ducks and geese; but it is in Currituck sound that they are found in greatest quantity. A number of small islands dot the shallow waters of the eastern side of this sound, where the wild celery and many kinds of grasses flourish in profusion. These are the favorite haunts of the mallard, red-head and canvas-back ducks. They frequent these island and shallow waters in incredible numbers. When feeding they cover this part of the sound for miles; when they take wing they present the appearance of a vast black cloud. Hunting these fowls (which command a high price) gives profitable employment to many people. This

region is the paradise of the amateur sportsman, and clubs of Northern gentlemen have lodges there, to which they regularly repair at the proper season for hunting.

The inlets connecting the sounds with the ocean have shifted very much since the country was first settled. Some that were navigable for vessels of considerable size have closed; and those that remain are navigable for vessels of slight burden only. The effects of these changes operated formerly as a great restriction upon the commerce of the northern half of our coast. These obstructions have at length given way before the spirit of enterprise and the progress of invention. A canal now connects the waters of Albemarle sound with Chesapeake bay, and steamers ply to every point from Newbern to Norfolk. This region of country, though once locked up, is now fully laid open to commerce; few indeed possess such ample facilities for transportation. In addition to this line of steamers there is another by the Chowan and Blackwater rivers, connecting with the Seaboard and Norfolk railroad. Lastly, a line of railway has been constructed from Edenton to Norfolk.

The Banks, as has been said, girdle the whole coast of the State, a distance of over three hundred miles. Though they shoot out from the northern extremity as a long narrow peninsula, they are broken in their course into a number of islands. They vary in breadth from one hundred yards to two miles, and in height from a few feet above the tide-level to twenty-five or thirty feet. Consisting as they do of pure sand, there is little culti-

vation of any sort. A few stunted trees are scattered over the more elevated parts, and occasionally, as at a point a few miles north of Nag's Head, there are forests of long-leaf pine covering hundreds of acres that compare in size and height with any on the main-land. The subsistence of the inhabitants is generally derived from fishing, in which they are bold and expert. They do not shrink from an encounter with the whale. In the early history of the State its coast was noted as one of the resorts of the whale. Lawson, who lived many years in the eastern part of the State, in the early part of the last century, says: "Whales are very numerous on the coast of North Carolina." A few still visit it, and a season rarely passes without one or more being harpooned by the fishermen of Shackleford's Banks.

The possessions of these islanders consist mainly of flocks and herds. Some proprietors own several hundred head of sheep and large numbers of horned cattle. Many own large herds of horses which roam the sands in a state almost as wild as on the prairies of the West. The latter receive little attention from the owners except at the "penning season," when they are driven together and branded with the mark of the proprietor. Like the other animals they forage at will upon the coarse though abundant grasses of the salt marshes. It is a breed of great spirit and bottom. Many of them are finely formed, and on account of their docility when well broken, and their powers of endurance, high prices are paid for them.

Formerly, when commerce was carried on exclusively in sailing vessels, this coast was justly dreaded, for shipwrecks were frequent. Large profits were then occasionally realized by these islanders, though at great personal risk, in the way of salvage on goods rescued from the sea. But the introduction of steam vessels, and the establishment of signal stations, have rendered navigation so safe that a shipwreck is rarely heard of.

Middle and Piedmont Section.

The Middle Section extends from the western boundary of the tertiary formation or Eastern Section to the Blue Ridge mountains, the western half of which, as already said, is distinguished as the Piedmont Section. It comprises nearly one-half of the territory of the State.

In passing from the Eastern to the Middle Section there is a marked change in the general aspect of the country in its natural and cultivated productions, and in other respects. The great Atlantic plain is left behind, which, on account of the uniformity of its surface, partakes of monotony, even where most fertile. Here, on the contrary, is an endless succession of hills and dales. Every step brings to view some new charm in the landscape—some new arrangement of the rounded hills, some new grouping of the tracts of forest which still cover so large a part of the country. The hills, indeed, in their gracefully

curving outlines, present lines of beauty with which the eye of taste is never satiated. These are attractions which depend upon permanent features of the landscape, and which, though infinitely heightened in their effects by the verdure of Spring and Summer, are only brought into fuller relief by the nakedness of Winter. The variations of surface, though less defined at first, become more marked towards the west, and towards the Blue Ridge the country assumes a bold and even rugged aspect.

The long-leaf pine, so conspicuous in the Eastern Section disappears, and is replaced by all that range of forest growth for which the State is so noted—a range in which there is scarce a tree that belongs to the temperate zone proper that is not only found, but found in abundance. If the two sections are viewed at the season when the crops are growing, the contrast is striking. Along with the long-leaf pine, the cotton crop, except on the eastern and southern border, has nearly disappeared also. Wheat, corn, sorghum, oats, buckwheat, barley and tobacco occupy the cultivated fields. In the Eastern Section hay and pasture crops have not been enough cultivated to impart any distinguishing aspect to the country. In the Middle Section clover and other grasses clothe the hills more or less; the larger bottoms are laid down in meadows; and commonly the narrow flats between the hills, made by the little branches or rivulets, are sown in grass and present belts of richest verdure. The change is seen in the streams: those of the

low-land are dyed to a sable hue by decaying vegetation with which the soil there is charged; those of this section are as clear and pure as they flowed from their fountains, mirroring in their pools and longer reaches every object on their banks. A difference in the Summer and Autumn is felt in the air of the two sections. That of the low-lands, though kindly and not unhealthy, disposes somewhat to lassitude and inaction at particular seasons; that of this section is invigorating and wholesome (being kept in perpetual motion at that season by gentle gales), and favors active exertion.

The hand of improvement is more visible in this than in any section in the State. This is chiefly due to two causes: 1st, Agriculture here was less dependent upon slave labor than in the Eastern Section. The number of slaves was less, and in many communities within its limits—as those made up of the Society of Friends, or Quakers—there were none. Hence agricultural industries which were prostrated there by the shock of the civil war—a shock from which it did not recover before years had elapsed—here sustained only a partial disturbance, and that for no long period.

2d. No part of this section was occupied for any length of time by hostile troops, and at the end of the war its means of subsistence were comparatively undrained. A basis was left for the resumption of industries. To this is to be added another advantage, the facility with which lands of the best class could be rented after the break up of the old plantation system.

All the large proprietors after the loss of their slaves had more land than they could cultivate; the only use they could make of it was to let it to rent. To young and energetic men a golden opportunity was thus offered. They went to work stimulated by the desire to redeem the time lost during their service in the army, and by the hope of acquiring lands of their own. But every one had lost heavily; the impulse to repair those losses was universal; labor, from the predominance of the white race here, was not greatly inadequate to the demand; hence every kind of business was pressed on with spirit and zeal. The effect in a few years was to obliterate all the deeper traces of the war; then the work of improvement began, and has been steadily carried on. This section is now dotted over with thriving villages and towns. The homes everywhere indicate a high degree of thrift and comfort; an unusual proportion are built in modern style and tastefully painted. Nestled amidst yards and gardens, enclosed with neat painted palings, flanked with orchards of fruit trees, in which a space is generally allotted to choice grape vines, they give abundant proof of ease, plenty, and, in many instances, of no small degree of luxury.

In this section nature has distributed her blessings with a bounteous hand. Its salubrity, the variety and value of its productions, its mineral wealth, its manufacturing facilities, mark it out as one of the most desirable abodes for man, and a future centre of great wealth and population. Nowhere do the conditions

which are friendly to health, to the finest physical development, to the successful exertion of industries of every kind, and to rational enjoyment, exist in greater abundance than here. Those bounties are visible only in part. The earth is stored with coal, iron, gold and other metals, ores and minerals. Explorations have demonstrated that these exist in such quantity that localities in this section will become the seats of mining and manufacturing industries on a large scale when population and capital shall favor their full development.

Of the extent of these ores, metals and minerals full information will be given hereafter in the Hand-Book.

The descent of the slope formed by the surface of the State is greatest in this section; through its entire extent, from one thousand to twelve hundred feet. The rivers in their eastward flow down this descent make their way with a lively current varied with long reaches of comparatively tranquil water. Oftentimes they force their way through huge barriers of primitive rock and there occur rapids and falls which afford the finest water powers.

The force developed by the fall of these rivers in their course to the sea aggregates—according to Prof. Kerr, late State Geologist of North Carolina—more than *three million horse-powers*; an amount exceeding that of all the steam engines of Great Britain or the United States.

These have been utilized to some extent by the erection of grist and flouring mills in every neighborhood,

and cotton and woollen mills on some of the rivers. Within the last few years the number of cotton mills has largely increased. Those erected lately are spacious buildings, and equipped with the best machinery. Within the same period all or nearly all of the older ones have been enlarged, and new machinery put in. The day is not distant when this branch of industry will attain a great development here. In no other form have investments paid heavier dividends. The fact begins to be more and more recognized that within the cotton States there are advantages for the manufacture of that staple that cannot be found elsewhere. Here the cotton is at the door of the manufacturer, and the prime cost of the material is therefore less. Wages are less here than in the Northern States, and a lower rate of wages here affords a more comfortable living than a higher rate there; for the necessities of life are cheaper, and less of food, clothing and fuel are required. Less fuel, too, is required for heating the mill in Winter. The laborer can make substantial additions to his means of subsistence from his garden, which is always allotted here to the head of the family. Here there is no obstruction to machinery from ice in Winter, and no greater suspension of work from drought in Summer; for our rivers are as long as those of New England and have as many tributaries. The original cost of the site and of the building here is very much less than the same cost there. The force of these reasons cannot be long resisted.

Woollen mills also have been established in this section, and though this branch of manufacture is yet in its infancy, the success which has attended the experiments that have been made, cannot fail to invite investments in this direction. Sheep husbandry cannot be said to have made even a beginning in this State. Sheep are a part of the domestic animals on every farm, but are reared for domestic supplies of meat and wool; the surplus only is sold. Yet the supply of wool would suffice for scores of such factories as are here. No pursuit would pay better than sheep husbandry in this State. The natural pasturage of the Mountain Section cannot be surpassed, particularly in the northwestern part of the State. Some of the most valued cultivated grasses are indigenous there, and all flourish with the greatest luxuriance. The quality of the goods turned out from the woollen mills of Salem, Bethania and Elkin show that the wool is adapted to the finest fabrics.

The wide range of the forest trees of North Carolina long since attracted the attention of botanists. It includes all those employed in the useful and many of those employed in the ornamental arts. Indeed, nearly all the species found in the United States, east of the Rocky Mountains, are found in North Carolina. Her wealth in this respect will be appreciated when the fact mentioned by that eminent botanist, Dr. Curtis, is brought to mind, that there are more species of oaks in North Carolina than in all of the States north of it, and only one less than in all of the Southern States east of

the Mississippi. For the range of her forests the reader is referred to the lists embraced in the Hand-Book. Those only are referred to here the timber of which, or their manufactured products, are exported from this section.

Of these the *white oak* (*Quercus alba*) is the most prominent, as being in most general use and most extensively serviceable. It is found from the coast to the mountains, but it is most abundant in the Middle Section. It is valuable for frame houses, for mills and dams, vehicles, agricultural implements, cooper's ware, ship building, and for all purposes where strength and durability are required. Tanners prefer the bark of this species of oak for preparing leather for saddles and other similar objects. It rises to the height of seventy or eighty feet, with a diameter of two to three feet.

The *white hickory* (*Carya tomentosa*), too, is found in the forests from the coast to the mountains; but that of the Middle Section for weight, tenacity, strength, and for its capacity for receiving a high polish, is pronounced by experts to be superior to any in the world. It is used for mill cogs, screws of presses, handspikes, capstan bars, bows, hoops, spokes and handles of tools. There are large establishments here for the manufacture of spokes, rims and handles, which are sent everywhere. The mature tree is about sixty feet high and eighteen or twenty inches in diameter.

The *white ash* (*Fraxinus Americana*) is found in both the Mountain and Middle Sections, but is manufactured for exportation chiefly in the latter. It furnishes the

common timber used in light carriages, for the shafts, frames, and parts of the wheels. Flat hoops, boxes, and the handles of many instruments are made of it. It is the only material of oars, blocks of pulleys, cleats, and similar naval implements, in places where it can be obtained. It is fifty to seventy feet high, and two to three feet through.

The *elm* (*Ulmus Americana*), is found in each section, though most abundantly in the Middle. For ship blocks it is of the highest value; for hubs of wagon wheels it is preferred to any timber. It is from thirty to fifty feet high, and twelve to eighteen inches through.

The *maple* (*Acer saccharinum*), is found throughout the State, but from its superior facilities for transportation, the timber is chiefly obtained in this section. The wood in old trunks is full of minute irregularities, like knots. These, if cut in one direction, exhibit a spotted surface, to which the name of *bird's eye* maple is given; while if cut in another direction, they produce a wavy or shaded surface, called *curly* maple. It is used in cabinet work, particularly inlaying mahogany. The tree attains a height of fifty to eighty feet, and a diameter of two to three feet.

The *beech* (*Fagus ferruginea*), is common here, and grows luxuriantly; but is most abundant in the Mountain Section, and will be reserved for particular notice under that head.

The *tulip* (*Liriodendron tulipifera*) tree, or poplar—the wood of which is so highly esteemed for carving

and ornamental work, for some kinds of furniture, and for coach panels—is native to all parts of the State, but is not so common in the lower section as the others. It is mentioned here because its lumber is chiefly cut and prepared in this section. It will claim consideration again under the head of Mountain Section.

The *persimmon* (*Diospyros Virginiana*), is found in all parts of the State; but it is here only that it is obtained to any considerable extent. It is employed for screws and many other implements. It is usually from thirty to forty feet high, with a diameter of eighteen to twenty inches.

The *black walnut* (*Juglans nigra*), is most abundant in this section. It is used for furniture, for gun-stocks, for hubs, and in house and ship building. It is a majestic tree, and grows to exceptional size in the Mountain Section, under which head it will be referred to again.

The *yellow pine* (*Pinus mitis*), is sparingly found in the Eastern Section, but enters largely into the composition of the upland forest through the Middle and Mountain Sections. Its uses are so familiar and universal as to need no enumeration. It is from forty to sixty feet high, with a circumference of four or five, and even six feet.

The *mulberry* (*Morus rubra*) tree, though not valued for its timber, is so important in another respect as to deserve mention. It grows in all parts of the State, but is least abundant in the lower section. In the Middle

Section it occurs so commonly that nature may be said to have laid the broadest foundation for the cultivation of silk there.

This does not exhaust the list, but it will serve to give a clearer idea of the timber resources of this section. But, though the materials for this branch of manufacturing abound here, a beginning only has been made. There are establishments for making wagons and pleasure vehicles, excellent both for material and workmanship; but great numbers of these are still brought in from other States. One branch of wood manufacture is prosecuted here with spirit and success—that of spokes and rims for carriages, and bobbins and similar implements used with the machinery of cotton and woollen mills. These are sent off in great quantities to distant parts of the United States, and to Europe and Australia.

The branch of manufacture which has been most fully developed here is that of tobacco. The kind of tobacco chiefly used in these factories is known as the *golden leaf*. It is a unique product which originated in this section, and is still mainly grown here; though its cultivation has been widely extended into the mountain section. The effects of this industry have been striking. Villages and towns have grown up at short intervals within a few years on the principal lines of railroad, where the large warehouses and factories, the handsome churches, school-houses, residences and stores give evidence of high prosperity. In some of these towns almost the whole business consists in prizing and manufacturing this com-

modity into different forms for the markets of the world. Of the productions of the State, none are manufactured at home to the same extent as tobacco. The fruits of it in the general prosperity which the factories have diffused around them give proof of what the State will be when its various commodities shall be even partially manufactured within its limits.

The cultivation of fruits of all kinds has been long pursued in this section with skill, energy and judgment. Its wonderful adaptation for fruits was early discovered, and many nurseries were established for rearing the young trees. Here the native fruits were perfected, choice foreign kinds introduced, and new kinds originated. The enterprise of the nurserymen has planted the finest fruit trees—as the apple, the peach, the pear, the apricot and the cherry—about every dwelling in this section, and widely beyond it. Nor have the garden fruits—as the fig, the currant, the raspberry and the like—received less attention. The supply of every kind for home consumption is unlimited—that of peaches and apples, such that large quantities are fed to hogs. Here, too, as in the Eastern Section, the grape is an object of special culture. They are grown for the table at home, and for the market. There are in this section several vineyards, some of which have an established reputation for their wines and brandies. Grapes are, however, grown mainly for the market. The genial soil and climate of this State enables the growers to put this and other fruits in the Northern markets some weeks in ad-

vance of the same fruits grown there, and at a season when the appetite for fresh fruits has been whetted by abstinence, and when they bring the highest price. When dried, also, they are a staple article of export. The process of drying was formerly effected entirely by the heat of the sun. This process is still partially in use, but within the last two or three years has been, in a great measure, superseded by mechanical appliances. Wild berries, whose bushes spring spontaneously and cover every cleared spot not in cultivation, have given rise to an important industry here. The business of gathering and drying blackberries gives employment to many persons, especially children, whose services would not be available on the farm. They are shipped in quantities inconceivable by those unacquainted with this branch of trade. The demand for them is large and increasing, and the incomes derived from this source are in the aggregate very considerable.

This section supplies with free hand much in the way of comfort and profit. Wheat, oats, &c., are cultivated to such extent that the country teems with small game, especially partridges. Every farmer *can, with his net*, with little loss of time, have his table supplied with this most delicate of luxuries, and they offer boundless sport to the lovers of such amusements. They are made a considerable article of trade. The quantity sent to the city markets amounts to tons. The rabbit, which abounds here, is also an article of trade as game, and this animal, together with the otter, minx and raccoon, furnish no inconsiderable amount of furs.

The different areas over which the cultivated crops of this section grow are well defined. Tobacco is the staple crop in the northern counties, though the cereals enter into the rotation; in the central counties the cereals are the principal crops; in the southern counties cotton is the staple crop, but in all of them the cereals are also cultivated.

"It is worthy of note," says Prof. Kerr, in his *Geology of North Carolina*, "that one of the two tracts in the whole territory of the United States, which are absolutely or almost free from that scourge of rigorous and extreme climates, pulmonary consumption, is located by these census maps"—the census maps of 1870—"along the plateau east of the Blue Ridge in North Carolina. One of the causes is doubtless the fact that this region is sheltered by the proximity of the Blue Ridge, which here reaches its extreme altitude, and stands as a protecting wall against the two prevalent and weather-controlling winds from the interior, those from the southwest and northwest, and indeed from the north as well."

There are many watering places in this section which have long been favorite resorts for health and recreation.

Western Section.

The Western Section is commonly called the Mountain Section, a name which on account of its prominent physical features is strictly applicable. It lies enclosed be-

tween the Smoky range on the west, and the Blue Ridge on the east; on the north and south it extends to the Virginia and South Carolina lines. In form it resembles an ellipse. Its width is from twenty-five to fifty miles; its length is about one hundred and fifty miles. It consists of a lofty plateau, the general level of which is from two to two thousand seven hundred feet above the level of the sea. This plateau forms a base, upon which is clustered together a great number of the loftiest mountains to be found in the United States east of the Rocky Mountains. The mountains which reach a height of 6,000 feet can be counted by scores; the number of those of an elevation but little inferior is almost countless.

On the eastern side of the plateau the mountains are massed together without any of that orderly arrangement common to most mountain systems. They are scattered, indeed, in wild disorder. On the western side a definite arrangement may be observed. The Watauga, the Nolchucky, the French Broad, the Big Pigeon and the Hiwassee flow nearly at right angles to and through the Smoky range. Between each of these rivers runs a chain of mountains parallel to them, and forming the divide between them. The mountains are clothed, with few exceptions, with trees to their tops. The exceptions mark a singular caprice of nature. Through these chains of mountains are found many upon whose broad summits not a tree is to be seen, and hence designated as *Balds*. They are covered to the height of a horse's knee with grasses that afford the finest pasturage.

The view from these lofty summits is inconceivably grand and beautiful. There is little of sternness; nothing of desolation in anything that meets the eye. Nature presents herself in her kindlier mood. The vast mountains loom up on every hand, but they are clothed with vegetation from base to summit. The element of color is not wanting. It is dispensed indeed with liberal hand. The lighter hues of the leaves of deciduous trees about the base and sides of the mountains are succeeded by the darker foliage of the pine and fir in the upper tiers, and the sombre foliage of the balsam on the highest tiers. Throughout the Fall, when the color of the trees is constantly changing, the different hues of the almost endless variety of the forest growth array the mountains in a glory that is indescribable. The view from one of these summits, at one season only, stirred the mind of Dr. Mitchell—a devotee of science and little given to emotion—to a burst of poetic expression, as when he speaks of the “green ocean of mountains raised in tremendous billows immediately around,” referring to the view from the top of the Roan. This section is a land where all the elements of beauty and grandeur are everywhere combined in a way to astonish and delight the beholder.

The forests of this section include most of the trees of the Middle Section, and many that belong to high Alpine latitudes—the same timber trees, and some that are peculiar to this section. The *wild cherry* (*Prunus serotina*) is found in each section, but here only does it

acquire its full dimensions, or occur in quantity. On the rich and cool declivities of the mountains it attains a height of from sixty to eighty feet, and a diameter of two to three feet.

The *white pine* (*Pinus strobus*), is found in this section of the State, and in this only. It forms peculiar and handsome forests in the rich elevated valleys of Ashe and Yancey. It is from sixty to seventy feet high, with a proportional diameter.

The *cucumber tree* (*Magnolia acuminata*), in this State grows only on the mountains, particularly of Ashe, Yancey and Burke, in moist, fertile soils of declivities and on the banks of torrents. It is from sixty to eighty feet high, and from four to five feet in diameter.

The *hemlock* (*Abies canadensis*), is also confined to this section. It grows on the borders of torrents and cold swamps, but extends down to the very base of the mountains. The bark is extensively and almost exclusively used for tanning in New England. Though inferior to oak bark, it is said that the two united are preferable to either alone.

The *black birch* (*Betula lenta*), or mountain mahogany, is found in this State only in the Mountain Section. It affords a firm, compact, dark-colored wood, much valued for furniture, and is sometimes used for screws and implements requiring strength.

The *white walnut* (*Juglans cinerea*), used in light cabinet work and in the hubs of carriages, is found upon bottom land and river banks in the valleys of the

mountains. It attains a height of fifty feet, with a diameter of three feet or more.

The *chestnut* (*Castanea vesca*), though found sparingly in the Middle Section, is confined chiefly to the mountains, from Ashe to Cherokee. It is invaluable for fencing; the rails split out straight and easily, and are said to last fifty years. It is also used for shingles and for cooperage. Its usual height is from fifty to seventy feet, and stocks are sometimes met with which, at six feet from the ground, measure fifteen or sixteen feet in circumference.

The *beech* (*Fagus ferruginea*), though found in the Middle Section, occurs here in greatest abundance, and here only attains its proper size. It rises from fifty to eighty, and even one hundred feet, with a diameter of two and three feet. It is used for plane stocks, lasts, card-backs and the handles of mechanical instruments.

The *locust* (*Robinia pseudacacia*), extends along the mountains, from the northern to the southern boundary of the State. In civil architecture this timber is not extensively used in buildings, but is employed for railroad ties and sleepers when it can be had. In naval architecture it is used to as great an extent as the supply will admit. It is also largely used by turners instead of box

The *linn* or *lime tree* (*Tilia Americana*), so well adapted for turners' work and so extensively used for the manufacture of wooden-ware, is common in this section. It seldom exceeds forty feet in height, with a diameter of twelve or eighteen inches.

In respect to those timber trees found here, in common with the other sections, the Mountain Section has the advantage of possessing an unbroken forest. In comparison with the extent of forest lands, the clearings here are mere patches.

There is little hazard in saying that there is nowhere in any of the States an equal area of land covered with timber trees of such various kinds, and of such value. The walnut, tulip trees (poplars), and oaks attain a size that would hardly be credited by one who had not seen them. The preservation of this magnificent forest is due to the fact that it has hitherto been inaccessible to transportation. Within the past few years much of it has been brought into connection with the markets of the world. One railroad line passes entirely through this section, and another branching off at Asheville and leading to the extreme southwest of the State, is in great part completed. Into the northwestern part of the State also a railroad has been completed and others projected, of which two are partially graded.

The cultivated productions of this section are the same with those of the Middle Section, cotton and rice excepted. Its garden vegetables are the same, but the cabbage and the Irish potato grow here to a degree of perfection that cannot be excelled anywhere. Among the fruits, its apples are noted for size and flavor. Peaches and grapes grow well generally; but, for their highest perfection, nature has made provisions by a suspension to some extent of her ordinary laws. Throughout the mountains,

in certain localities and at certain elevations, there are horizontal belts where frost is never known. Such localities are found not only in this section, but in the South mountains and in the Brushy range. They constitute an unfailing source of supply of these fruits, and in process of time will be occupied by establishments for canning fruits for the markets of the world.

The climate of this section differs less from that of the Middle Section than would be inferred from its higher altitude. The difference is more perceptible in Summer than in Winter. In the former season, its cool and bracing air, together with its varied scenery, its mineral waters—sulphur, chalybeate and thermal—made this section one of the favorite resorts of the people of the South and Southwest, when it could only be reached by private conveyances. Since it has been penetrated by railroads, the influx of health and pleasure seekers has increased an hundred fold, and in future will add very largely to its resources.

It is the resort, too, of people from the far North in Winter. It is protected by the range of mountains which form its boundaries from all the cold winds—the north-east, north and northwest. The degree of cold is therefore temperate. A pinching season may come at long intervals; it is, however, of short duration, being quickly succeeded by weather of a moderate temperature. Such seasons are not unwelcome by way of contrast. The quantity of snow that falls here very little exceeds that of the Middle Section. Even in the high mountain

ranges, cattle are excluded from pasturage by the snow only once in about seven years.

The soils of the basins of the great rivers of this section, and its mountain valleys, are noted for their fertility. The capacity for the production of cereals and hay grasses is equal to those of any lands. As might be inferred from the heavy forest growth with which the entire surface is covered, the mountain sides are susceptible of profitable cultivation up to their summits.

Among the valleys most noted for their beauty and extent are the Upper French Broad and Mills river valleys, of Henderson and Transylvania; the Swannanoa, in Buncombe; the Pigeon river, Richland and Jonathan's creek flat lands, in Haywood; those of the Valley river and Hiwassee, in Cherokee; and portions of the Upper Linville, in Mitchell.

The entire transmontane country is well adapted to stock raising. The cultivated grasses flourish everywhere with even ordinary care. But it is in the northwestern counties—particularly in the counties of Ashe, Alleghany, Watauga, Mitchell, Yancey, that all the conditions are found necessary for its perfect success. The soil throughout these counties is a deep rich loam, up to the summits of the mountains. The whole country is covered with a dense vegetation, amongst which will be found some of the largest timber in the United States, and as yet the forests are comparatively unbroken, because they have been inaccessible to market. The clearing of the timber is a work of some difficulty, but when that is done the labor

of the farmer is rewarded with the richest crops. After two or three crops are taken off, the land, if suffered to lie at rest, springs up spontaneously in timothy, herds grass, and other rich pasture grasses; and once established, the grass perpetuates itself upon the land. Nor is an entire clearing necessary to establish the land in grass. If the undergrowth is removed, the trees thinned out, and the surface stirred and sown in orchard grass (Cocks foot), it flourishes luxuriantly, even while the forest trees are left standing.

Its capacity as a grazing country has long been known. But formerly the cattle were left to the resources of nature, which, indeed, in such a country were abundant and rich. "Horses and horned cattle," says General Clingman in one of his publications, "are usually driven out into the mountains about the first of April and brought back in November. Within six weeks after they have thus been put into the range, they become fat and sleek. There are, however, on the top and along the sides of the higher mountains ever-green and winter grasses on which horses and horned cattle live well through the entire Winter. Such animals are often foaled and reared there until fit for market, without ever seeing a cultivated plantation." Of late, attention has been turned to the breeding of fine stock, and some herds of cattle and flocks of sheep are found there which will compare not unfavorably with those of any country. This country is already penetrated by one railroad, and others are in course of construction. When fairly laid open to rail-

road communication, it will offer—besides its rich mining interests and timbers—one of the finest fields for cattle and sheep breeding and for dairy products that the Union presents.

Apart from its forests, nature has been prodigal to this section in shrubs and flowering plants. It has always been a favorite resort of the botanists. It is a field that has been assiduously cultivated by many of the most distinguished professors of that science. It was from these mountains that Bartram, the Michaux—father and son—Fraser, Delile, Lyon, Nuttall, Von Schweinitz, Mitchell, Gray and Curtis, drew much of the material of their valuable contribution to botanical science. It was here that some of the most beautiful flowers that adorn the gardens of Europe and of this country were first discovered. It still yields rare flowers to the explorer, which though not conspicuous for their beauty, are deemed rare treasures by botanists.

This section has also been one of the chief sources of supply of medicinal herbs. Immense quantities are gathered and shipped to the Northern cities and to Europe. In travelling through the mountains bales of these herbs may be seen collected about the country stores as bales of cotton are seen in the Middle and Eastern Sections. Ginseng in great quantities is shipped to China. The trade in medicinal herbs has grown into a large business.

The mineral wealth of this section is varied and abundant. These will be simply mentioned here, as each

will form, in the Hand-Book, the subject of a separate notice. Marbles of the finest quality and of various colors compose whole mountains, so to speak, in Macon and Cherokee.

Corundum abounds in Macon, Clay and many other counties. Mica is abundant in Mitchell and Yancey, and those counties yield a large part of the world's supply. The largest and finest sheets of it seen at the World's Fair at Vienna were from the Ray Mine in Yancey.

This section is rich in iron ores of the best grade. That of Cranberry possesses such excellence for making iron for special purposes—steam boilers for example, and steel of the finest quality, such as is adapted to making surgical instruments and the like—that a railroad forty miles long has been constructed through one of the most rugged parts of the mountain territory to reach it. Copper also is prominent among the metals of this region. The most noted mine is that of Ore Knob, in Ashe. It has been extensively developed, and the business in all its branches is conducted with intelligence, skill and energy.

The effect of these mining enterprises upon the prosperity of this section has been marked. Labor has found profitable employment, a home market has been furnished to the farmer, and there has been a general appreciation of property of every kind.

The last three years have been remarkable for the success with which the difficulties presented by the want

of transportation in this State have been grappled with and overcome. These achievements at once great and beneficent, will make this period a memorable one in the history of the State. Railroads are now entering the northwestern part of the State in several directions. The completion and connection of these, and the opening up of this region, so rich in elements of undeveloped wealth, is now regarded as the first and most imperative duty of the statesmen of North Carolina.

Geological Formations.

The soils of the Middle and Mountain Sections may be treated of in one view, since they owe their origin to the same cause. The rocks of this part of the State were brought into the position they now occupy at an early period of the earth's history; the soils that have been formed upon them have resulted from their disintegration and decay. No stratum of foreign matter has been brought in from abroad in either of these sections, that which has been caused by rain water rushing down the sides of hills and flowing along the beds of streams alone excepted. The rocks are chiefly of the primitive formation, granites, schists, slates, &c. The soils vary in chemical composition and fertility, according to the character of the rocks from which they are derived. The rocks range with the sea-shore and the mountain

chains, and run uniformly in a direction from northeast to southwest. A brief notice of the principal formations of rocks is here subjoined, and the characters of the soils of each discriminated in a general way.

West of the Eastern Section—in our early geological reports termed *Tertiary*, and by the later distinguished as the *Quaternary*—there occurs, in the counties of Northampton, Halifax, Johnston, Nash, Franklin, Warren, Granville, Wake and Cumberland, a body of ancient primitive rock largely covered by sand—*Laurentian*. Amongst these granite prevails more extensively than any other, and when the tertiary sand is absent, there is fertile soil.

The next formation of rocks going west is the sandstones—*Triassic*. It commences in Granville, three or four miles southwest from Oxford, and passes through Orange and Wake, Chatham and Moore, Montgomery, Richmond and Anson; but through a part of Moore, Montgomery and Richmond, it is covered by tertiary sand and clays. The principal constituent of this formation is a fine-grained, greenish or reddish sandstone, whose particles are connected together by a mixture of clay and oxide of iron. This produces by its decomposition a soil favorable to the growth of corn, oats, and especially sweet potatoes; but is not so well adapted to that of wheat.

The next formation is that of the transition and slate rocks—*Huronian-Taconic*. These occupy a large space in North Carolina. The principal body of these rocks

traverses the State in a northeasterly and southwesterly direction immediately west of the great sandstone formation, occupying a breadth of about thirty miles. This formation includes the western part of Granville, the eastern part of Person, the central part of Orange, more than half of Chatham, nearly the whole of Randolph, the whole of Montgomery (what is called sandstone excepted), the whole of Stanly, the southern corner of Davidson and Rowan, the northwestern part of Anson, and southwestern part of Mecklenburg. The most common and abundant constituent of this formation is a compound of silica and alumina; a simple argelite or clay slate. This prevails especially near its two extremities; in Granville and Person on its northern, and in Anson, Mecklenburg and Stanly on its southern extremity. The slate undergoes decomposition slowly, and has not to this day covered itself with any great depth of earth. The soil is never of a very high degree of fertility, but with good cultivation excellent crops are obtained. The adaptability of these lands to the growth of fine yellow tobacco has very much enhanced their value.

Throughout this body of slate, nowhere very thick, the granite occasionally penetrates and rises to the surface in tracts larger or smaller. In the southern part of Person, in Orange, Chatham, Randolph and Davidson, there are large patches of granite; and there results a much higher degree of fertility in the soil.

West of the slate formation a vast body of granite rock traverses the State including in its area a large

part of the counties of Person, Caswell, Orange, Guilford, Randolph, Davidson, Rowan, Cabarrus, Mecklenburg, Lincoln, Iredell, Davie, Stokes and Rockingham—*Laurentian*. Throughout this region mica, one of the usual constituents of granite, is rare, and is replaced by chlorite or hornblende. The whole mass of rock, with a structure more or less granitic, has an earthy aspect indicating a recent origin. In consequence it decomposes readily and into a fertile soil. Two of the three constituents of the granite—mica and felspar—furnish by its disintegration valuable ingredients to the soil. Both contain a considerable percentage of potash, though from the refractory nature of the mica, the potash, that element so essential to tobacco and the smaller cereals, is chiefly derived from the felspar. When chlorite replaces the mica it adds, upon the decomposition of the granite, another element, magnesia, its chief ingredient; an element indispensable to the healthy growth of the corn plant (maize). When mica is replaced by hornblende the latter supplies from its ingredients both magnesia and lime, and the presence of lime is a fundamental condition of fertility in all soils. And it is observable that of the region occupied by this formation—which is the great grain growing region of the State—the tracts where hornblende predominates in their composition, as in Cabarrus and Mecklenburg, are superior to the rest. West of this formation are the most ancient primitive rocks (*Laurentian*). Here every form of granite is met with. The ternary compound of quartz, felspar

and mica is most common, but with endless diversities, depending upon the proportion, color, size of the grains, and other character of the constituent minerals. There occur here also indefinite alternations of gneiss, hornblende and micaceous schists, and occasionally chloritic and talcose slates. There is a great variety of soil, subordinate, however, to that general uniformity which characterizes the same formation; for most of the above rocks are essentially granitic.

There is another body of transition slate in the western and northwestern part of the State, adjacent to Tennessee (*Huronian-Taconic*). It ranges along the western half of the border counties, but through Yancey and Mitchell shoots off a long projection, extending quite across the Blue Ridge to the Catawba, in Burke, and extends northerly and southerly, coincident in general direction and partly in position, with the Blue Ridge.

The fertility of soils so far as it depends upon their own constitution and the character of the rocks from which they have been formed, is determined by other circumstances :

1. Their composition; as the principal rocks of the Middle and Mountain Sections are included under the term granite, this has been already explained.

2. Their susceptibility of disintegration by the action of the elements.

This depends very largely upon their position; if the position is horizontal, they present their surfaces only to the disintegrating agents and long periods of time are

necessary to produce any effect. But the rocks of these sections have been upheaved by the forces of nature and laid upon their edges. They have thus been exposed to weathering influences to their fullest extent. The rain water could easily sink along the lines of stratification, and the air find ready access. The result has been a decomposition of the various strata to the depth of thirty, fifty, and even a hundred feet; as is proven in sinking wells, and illustrated in railroad cuttings. In this condition of things super-abundant moisture is absorbed, and the roots of trees and of vegetation range freely, and appropriate the lime, potash, soda and other mineral elements yielded by the decomposing rocks.

3. The amount of decayed vegetable or animal matter the soil may contain.

The uncleared land here has stood in woods for a period of time it is impossible to reckon. Hence the soil is charged with vegetable matter from the annual fall of leaves, from the decay of successive generations of trees; and from the dying out of the annual native grasses. It has too received into its bosom the remains of the various forms of animal life which have peopled the country from the beginning of things. When the lands have been exhausted by cultivation, they quickly cover themselves with trees, shrubs and grasses, and the vegetable matter is soon replenished.

PEOPLE OF THE STATE.

In all those things which stamp a high moral impress, no people can look back upon the past with more pride than those of North Carolina. From the foundation of the colony they have always been noted for those traits of character which give the greatest security to the State, to society and the family. They have always upheld the exercise of constitutional authority; the social duties they have always appreciated and observed; and by none have the domestic ties been more prized and cherished. Industry, frugality, and social order have marked every stage of their existence. Yet more, reverence for truth—especially revealed truth—and a sacred regard for business engagements have been ingrained in them.

An observer would be at once struck by the homogeneity of the people, and with the agreeable spectacle of two races living in harmony on the same soil and under the same laws. The first is rare in this age of migration, and particularly in this country, but is easily explained by the natural barriers to commerce which excluded variety of pursuits and made the State essentially an agricultural community. The conservative disposition and tastes which these modes of life nurtured repressed any effort to make known the resources of the State, and to attract settlers. But under the stimulus of

our system of railroad transportation which has, in a measure, redressed our natural disadvantages; the new order of things, brought about by the war, and through the necessity of cultivating smaller farms and the consequent surplus of lands in market, a new spirit has characterized the people and turned a general desire toward immigration.

In regard to the harmony existing between the two races, Gov. Jarvis, in his annual message to the Legislature, in 1881, said:

“The two races are working together in peace and harmony, with increasing respect for each other. The colored population, I am glad to say, are becoming more industrious and thrifty. Many of them are property owners and tax payers. They seem to be learning the important lesson that they have nothing to rely upon but their own labor. I have tried, on every opportune occasion, to impress this lesson upon them, and to assure them of the sympathy and hearty co-operation of the white race in their efforts to make themselves good and useful citizens. They have held during the past two years, in the city of Raleigh, two industrial exhibitions that were exceedingly creditable to them. I attended both of these exhibitions, and made short addresses, and was glad to see that the efforts of the colored race in this direction found so much favor and encouragement among the whites. I regard it as an imperative duty from which the whites cannot escape, if they would, to see that in all things full and exact justice is done the blacks, and that they are not left alone to

work out their own destiny. They are entitled, by many binding considerations, to receive aid and encouragement from the whites, in their efforts to be better men and women, and I have no doubt will receive it."

The events of the past five years have confirmed the justness of this official statement.

The natural increase in our population has been greater than that from natural and foreign sources in most other States, and now ranks it as the fifteenth in the number of its inhabitants in the Union. It increased from 1,071,361 in 1870 to 1,399,750 in 1880, and can now be safely estimated at 1,500,000. Classified by the census according to sex there were, in 1880, 687,908 males, and 711,842 females; by race, 867,242 whites, 531,267 colored people, 1,230 Indians and 1 Japanese. The aggregate population consisted of 270,994 families, living in 264,305 dwellings. The number of persons to a square mile was 28.81, the number of families 5.58, dwellings 5.44. The number of acres of land to a person 22.21, to a family 114.73. The number of persons to a dwelling 5.30, to a family 5.17.

The percentage of increase from 1870 to 1880 was 30.06; of density of population 8 per cent.

Distributed according to topography, 421,157 of the population live on the South Atlantic coast; 743,739 on the interior plateaus and table lands; and 233,654 in the Mountain districts. According to the same distribution 203,771 colored people live on the South Atlantic coast; 300,236 on the interior table lands, and 27,270 in the Mountain districts.

GOVERNMENT AND TAXATION.

The government of North Carolina is a pure democracy. It is based upon the will of the people as expressed in the Constitution, an instrument framed by them in their sovereign capacity through delegates appointed for that purpose. The will of the people of this and of each State, when thus expressed, and in conformity to the Constitution of the United States—for the will of the people of each State is subordinate to the collective will of the people of all the States—is the supreme law. The State Constitution thus made is the measure and test of all laws passed by the Legislature, and these laws must stand or fall by their agreement or disagreement with it.

The Constitution is a short instrument but wide in its scope and bearing. It contains a brief statement of the fundamental principles of civil and individual liberty, creates the different departments of government—Executive, Legislative and Judicial—and prescribes the powers of each; establishes educational, charitable and penal institutions; directs who shall be liable to duty in militia; and prescribes the rights of citizenship.

The Legislature enacts laws. The Judiciary passes upon them when a question arises as to their constitution-

ality, and expounds them when a question is presented as to their meaning. The execution of the law is entrusted to the Executive. The Executive in this State possesses no veto upon the acts of the Legislature. When the law is once made, his duty as that of every other citizen is obedience in his sphere.

The rights of citizenship is the only point for consideration here; and these depend upon age, residence and previous citizenship.

A citizen of a foreign country can make himself a citizen here by becoming a resident; declaring before the proper tribunal his purpose to become a citizen; and taking the prescribed oath of allegiance.

A citizen of any other of the United States becomes a citizen here by changing his residence from that State to this.

All persons who are born and continue to reside within this State are citizens thereof.

The chief privilege of citizenship is suffrage. The Constitution ordains that, "every male person born in the United States, and every male person who has been naturalized, twenty-one years old, or upward, who shall have resided in this State twelve months next preceding the election, and ninety days in the county in which he offers to vote, shall be deemed an elector."

Suffrage here embraces the right to vote for every officer in the State from the Governor down to constable. One only exception to this principle exists in this State—that is in the case of Justices of the Peace. These are appointed by the Legislature. Logical consistency was

sacrificed in this case to secure what, in the judgment of the Convention, was a point of far higher importance, namely, the sound administration of justice in the county, and the administration of county finances, both of which are under the control of the Justices. In many of the eastern counties the colored population largely predominates. Newly emerged from slavery, and consequently ignorant of the duties of citizenship; ignorant of the law and therefore incapable of administering it; themselves without property and therefore without the judgment necessary to administer the finances of a community; it was deemed best to repose the power of making magistrates in another body; thus guarding those communities against error, whether of ignorance or design, until experience and education should make those colored majorities safe repositories of such power. This provision of the Constitution was inspired by no feeling of enmity toward the colored man; it was a provision of safety as well for the colored as for the white man. The provision was made impartial in its operation; it applies to every county in the State, whether the majority be white or black, and the object was secured. No such provision was necessary in the cases of officers elected by general ticket, for there the experience of the white population accustomed to the exercise of citizenship and educated to its responsibilities would counterbalance the inexperience of the colored race.

Citizenship under the Constitution of North Carolina carries with it high and important rights apart from suffrage. It confers a right to an education by the

State, such as will qualify the citizen for the duties to be performed. If he be without property, it gives him a right to support from the county, if incapable of earning it by sickness or old age. If he have property and is overtaken by irremediable misfortune, it exempts from execution personal property to the value of five hundred dollars, and vests in the owner in fee simple the homestead and the dwellings and the buildings used therewith not exceeding in value one thousand dollars to be selected by him. The unfortunate have thus a secure refuge in case of disaster in business.

It regulates taxation by providing that the General Assembly levying a tax shall state the object to which it is to be applied, and enjoins that it be applied to no other purpose. It establishes an equation between the property and the capitation tax by directing that the capitation tax levied on each citizen shall be equal to the tax on property valued at three hundred dollars in cash. The capitation tax is levied on every male inhabitant in the State over twenty-one and under fifty years of age, which shall never exceed two dollars on the head. The effect of this limitation upon the capitation tax restricts the tax on each hundred dollars' worth of property to sixty-six and two-thirds cents. It further directs that the amount levied for county purposes shall not exceed the double of the State tax except for a special purpose and with the approval of the Legislature.

The rate of State tax levied for the present year is twenty-five cents on one hundred dollars besides twelve and a half cents, school tax.

EDUCATION.

The Constitution of North Carolina, adopted in 1776, ordained as a part of the fundamental law that "schools shall be established for the convenient instruction of youth, with such salaries to the masters, paid by the public, as may enable them to instruct at low prices." As soon as the resources of the State permitted, this provision of the Constitution was carried into effect. Long before the civil war the system of common schools in this State had attained a full development. A fund of two millions of dollars had been accumulated, the income from which was supplemented by annual appropriations. From 1852 to 1861 our educational progress attracted general attention and admiration. This fund was engulfed in the war, and the system had to be built up anew from the very foundation.

The provision for State education under the new Constitution of North Carolina, if not equal to that of some other States, is yet liberal. The Constitution sets apart a large extent of land, and appropriates all moneys arising from certain specified sources, for establishing and maintaining free public schools in the several counties of the State. Further, it directs the appropriation of 75 per cent., at least, of the State and county capita-

tion tax to the same purpose. The moneys from these sources form a permanent fund for education which cannot be diverted. The legislation of the last few years shows a growing sense of this great interest. That of the session of 1881 was a marked advance on any that had gone before. In addition to the provisions specified above, a tax of twelve and a half cents was levied on every hundred dollars worth of property and credits, and the tax on the poll was correspondingly increased thirty-seven and a half cents in aid of the education fund. The revenue from these sources was reckoned to be fully adequate to keep open the public schools for four months in the year. If the tax thus levied should prove insufficient to maintain one or more schools in each district for the period named, the county commissioners are required to levy annually a special tax to supply the deficiency. The ages for admission to the public school range from six to twenty-one years.

The organization provided for administering the common school system is sound and judicious. The Constitution provides a State Board of Education which has full power to legislate in relation to free public schools and the educational fund of the State. Its legislation is subject, however, to be altered or amended by the General Assembly. A Superintendent of Public Instruction presides over and directs the operations of the whole system.

Corresponding to a State Board and State Superintendent, there is a county Board and county Superintendent.

The county Board is charged with the general management of the public schools in their respective counties. The county Superintendent examines applicants for positions as teachers, visits and inspects the public schools, advises with teachers as to methods of instruction and government, and he may, under regulations prescribed, suspend teachers if incompetent or negligent; his action in the latter case being subject to review by the county Board.

The county Board of Education of each county has authority to establish a teacher's institute in their county, or the boards of any number of counties may join in establishing one for the several counties so co-operating.

Each county is laid off into school districts, the convenience of each neighborhood being consulted. In each district there is a school committee consisting of three persons. It is the duty of the committee to provide school-houses, employ teachers, and give orders for the payment of the sums due for their services, and take at a stated period a census of the children within the school age.

The compensation provided for teachers of the first grade is left to the discretion of the committee; that of teachers of the second grade is twenty-five dollars a month; that for those of the third grade is fifteen dollars.

The schools for the two races are separate; the districts the same in territorial limits, or not, according to the convenience of the parties concerned.

The financial arrangements with respect to the school fund give the most absolute security for its safe custody and proper application. It is collected by the sheriff and by him paid to the county treasurer. It is drawn by a written order of the district committee, which order is countersigned by the county Superintendent. The school fund, it will be seen, is handled by none but bonded officers, and paid out under the most effective checks for its proper disbursement.

For the purpose of training teachers, and thus giving unity to methods of instruction, and the greatest efficiency to its practical working, thirteen Normal Schools are established—eight for the white and five for the colored race; and an equal fund is appropriated to the Normal schools for each race. Within the last few years graded schools have been established in all the principal towns of the State, and the number is yearly increasing.

The provision for higher education is ample. Private schools for both sexes are numerous. The principal institutions for the education of boys and girls are of the highest order.

At the head of the institutions of learning is the University of the State, an institution established in pursuance of the Constitution, and maintained in part by annual appropriations. Science and learning in their widest range are there taught by professors eminent in their several branches. Second only to the University are the denominational colleges of the State, each having a corps of learned professors and tutors.

RELIGION.

The laws of North Carolina do not recognize any one religious sect in preference to the rest; they are all absolutely independent of the control of the State. Each sect is thus on an exactly equal footing with every other. The people, however, are almost entirely Protestant of various denominations.

STATE DEBT.

The following tables contain a statement of the debt of the State of North Carolina, taken from the report of the Treasurer, made to the General Assembly, at its session in 1885:

Actual debt bearing four per cent. interest...	\$2,967,000.00
Prospective debt bearing four per cent. interest	622,511.25
	<hr/>
	\$3,589,511.25

The item designated as "prospective debt" represents bonds not yet exchanged under the "act to compromise the State debt."

Actual debt bearing six per cent. interest....	\$2,310,000.00
Prospective debt, bearing six per cent. interest (old bonds now being renewed).....	485,000.00
	<hr/>
	\$2,795,000.00

This latter debt, \$2,795,000, was incurred for the construction of the North Carolina Railroad, which is in great part owned by the State. The income from the dividends realized by the road is not only sufficient to pay the interest, but leaves a surplus which is regularly funded from year to year, the aggregate of which will extinguish the debt at the maturity of the bonds. This debt does not now impose, nor will it in future impose, one cent of taxation upon the people of the State. The first amount, \$3,589,511.25, therefore represents the entire debt for which the property of the State is subject to be taxed.

The total valuation of real and personal property in North Carolina is, according to the Auditor's Report for 1885, \$209,569,096. But the valuation of property in this State is known to be from one-third to one-half below its real value. For the purpose of ascertaining the true value of the property of the State, an addition in that proportion must be made to the valuation above given. Taking, however, the valuation as given in the Auditor's Report, it will be seen that a tax of seven and one-half cents upon the hundred dollars worth of property will pay the interest upon the whole State debt.

But there exists in fact no necessity for such a tax, light as it would be. The act under which the debt was compromised, appropriates certain taxes therein enumerated, known as privilege taxes, to the payment of the interest; and by the terms of the act this appropriation is made a part of the contract between the State and

the bondholders, and is therefore inviolable. From this source the amount realized is so large, that the remainder of the interest is provided by a tax of only four cents on the hundred dollars worth of the property of the State.

PUBLIC INSTITUTIONS.

The three Asylums for the Insane, the two Institutions for the Deaf and Dumb and the Blind, the Orphan Asylum and the county Poor Houses constitute the public charities of the State. The Penitentiary, county Jails and city Police Prisons are its penal institutions. All are supervised by the Board of Public Charities. Two of the asylums for the insane, one at Raleigh and the other at Morganton, are set apart for white patients, and have a capacity of six hundred and seventy-nine inmates. At Goldsboro is situated the asylum for the colored insane. It has a capacity of one hundred and seventy-five patients.

There is an institution for the white and one for the colored deaf and dumb and the blind children in the State, both situated at the Capital and under the same management. The pupils must be between the ages of eight and twenty years to gain admission, and are educated and maintained while at the institution.

The Orphan Asylum, at Oxford, is maintained by the charity of the Masons and other benevolent persons; it receives an annual appropriation of ten thousand dollars per annum from the State. The inmates are clothed, fed and taught the rudiments of English and some trade or business.

The Board of County Commissioners is charged with the duty of maintaining by taxation and of providing for the comfort and well ordering of the poor. A competent person, called the Overseer, has the immediate management of the Poor House in each county, and generally it is well provided and appointed.

The Penitentiary is located at the Capital and is one of the most substantial buildings of its kind. The number of criminals in proportion to the population of the State is small, when it is remembered that a large fraction of that population was once in slavery and had to be educated to the laws. Of this number 10 per cent. were convicted of crimes against persons. In this class all grades of crime from murder to aggravated assaults are included. The rest are committed for crimes against property. A large majority of this class of convicts are imprisoned for the crime of larceny.

The State Capitol, the Agricultural Department Building, the Supreme Court Building, and all the Buildings of the Public Institutions are of a substantial and commodious character that reflects the general character of the people. The Capitol is built of massive granite, and the other buildings of brick or a combination of brick and granite.

DESCRIPTIONS OF COUNTIES.

The counties are here grouped under the heads of the several agricultural regions to which each predominantly belongs, or, in some cases, under that to which it is popularly assigned. Each county is described as a whole.

The statements of areas of woodland, etc., refer to the original state of things, irrespective of tilled or otherwise improved lands.

The descriptions of counties are by Prof. W. C. Kerr, late State Geologist and Special U. S. Census Agent.

SEABOARD REGION.

(Embraces the counties of Currituck, Camden, Pasquotank, Perquimans, Chowan, Dare, Tyrrell, Washington, Hyde, Beaufort, Pamlico, Craven, Carteret, Jones, Onslow, Pender, New Hanover, Brunswick, Columbus).

CURRITUCK.

Currituck county is bounded northward by Virginia, eastward by the Atlantic ocean, and southward mainly by Albemarle sound, and is traversed north and south by Currituck sound, which occupies about one-third of its territory. Between this sound and the Atlantic ocean lies a narrow strip of sandy soil, which in its origin is a sand-dune of the breadth of from 1 to 3 miles, rising in some of its higher hillocks to nearly one hundred feet, covered generally with a small growth of pine, oak, hickory, dogwood, etc. The body of the county, particularly the northern section, is quite level, and has a

growth of oaks, hickory and short-leaf pine, and a clay loam soil, but becomes swampy near the streams. There is a narrow belt of oak and pine lands also in the middle section. The narrow southern promontory which projects into Albemarle sound is for the most part sandy, and except along the margin of the sounds, where it is more or less swampy, has a growth of long-leaf pine. With the exception of the dune hills, nearly the whole county lies below the level of 10 feet above tide.

The soils of this county are much better adapted to corn and rice than to cotton. The stalk of the latter grows luxuriantly, but does not fruit well. Fishing is also naturally a leading industry; and the county has great facilities for truck farming, which is rapidly acquiring importance. Of the county area, 22.41 per cent. is tilled land, of which 0.78 per cent. is cultivated in cotton.

The most abundant facilities exist for shipping by the sounds and canals and by rail.

Population 6,476—White 4,495, colored 1,981. Area 282 square miles, woodland 41,119 acres, tilled land 40,455 acres. Area planted in cotton 316 acres, in corn 23,310 acres, in wheat 101 acres, in oats 267 acres. Cotton production 139 bales, average cotton product per acre 0.44 bale, 627 pounds seed-cotton, or 209 pounds cotton lint. Real property, aggregate value \$432,410, personal property \$243,129, total \$678,837. State taxes \$847.29, county taxes \$13,662.72, school taxes \$2,634.03. Live stock—horses 1,098, mules 231, cattle 4,793, hogs 14,372, sheep 3,123. Public schools 35, white 24, colored 11. Churches 11.

CAMDEN.

Camden county is a long narrow strip of territory parallel to Currituck. Northwestward it reaches the Dismal swamp and southward Albemarle sound, and lies between two of its projecting arms, Pasquotank river and North river. The northern and larger portion of this county belongs to the description of semi-swamp or oak flats, and along the main rivers, and frequently for a mile or two from their margins, are gum and cypress swamps. At a distance from the streams these lands, as in the preceding county, are characterized by a heavy growth of oak, hickory, short-leaf pine, etc. The middle portion of the southern end of this county, along the divide

between its two bounding water-courses, has a narrow zone of sandy loam soil with long-leaf pine forests. The main crops are corn and cotton, with some small grains; but fishing and truck-farming are also among the common and profitable industries, and several thousand bushels of flaxseed are annually exported. Of the county area, 26.20 per cent. is tilled land, of which 7.44 per cent. is cultivated in cotton.

Shipments are made to Norfolk by the Dismal Swamp canal and by rail.

Population 6,274—White 3,791, colored 2,483. Area 214 square miles, woodland 65,729 acres. Tilled lands 35,870 acres, area planted in cotton 2,670 acres, in corn 23,663 acres, in wheat 461 acres, in oats 1,008 acres. Cotton production 823 bales, average cotton product per acre 0.31 bale, 438 pounds seed-cotton, or 146 pounds cotton lint. Real property, aggregate value \$377,342, personal property, \$203,951, total \$581,293. State taxes \$396.71, county taxes \$6,230.30, school taxes \$2,766.64. Live stock—Horses 994, mules 286, cattle 2,811, hogs 8,334, sheep 1,515. Public schools 27, white 16, colored 11. Churches 15.

PASQUOTANK.

Pasquotank is a long, narrow strip of territory parallel to Camden county, and is of similar topographical situation and agricultural features. It is bordered eastward and westward by two bay-like arms of the sound, Pasquotank river and Little river, both of which take their rise in the Great Dismal swamp. The upper and middle portions, therefore, belong to the general description of swampy land and semi-swamps. Near the streams there are generally strips of swamp proper, with gum, cypress and juniper forests, but farther from them are semi-swamps and oak and pine flats, with oak, hickory, short-leaf pine, ash, maple, black gum, and holly. These lands are of great fertility. The southern end of the peninsula on the sound is, as usual, sandy, piny woods. The industries of the county are the same as those of Camden. More cotton is produced, and lumbering still constitutes an item of consequence, as also in all these Albemarle counties. Truck farming is also assuming large proportions, and the raising of early potatoes for the northern market has recently become one of the most profitable industries. Of the county area, 34.62 per cent. is tilled land, of which 7.79 per cent. is cultivated in cotton. All these Al-

bemarle counties have unlimited facilities for transportation through their numerous bays, rivers, and sounds, which are connected with Norfolk harbor through the Dismal swamp and the Currituck canals, and also by railway.

Population 10,369.—White 4,855, colored 5,514. Area 232 square miles, woodland 44,345 acres. Tilled lands 51,400 acres, area planted in cotton 4,004 acres, in corn 28,525 acres, in wheat 3,300 acres, in oats 1,930 acres. Cotton production 1,181 bales, average cotton product per acre 0.29 bale, 420 pounds seed-cotton or 140 pounds cotton lint. Real property, aggregate value \$955,431, personal property \$430,428, total \$1,385,859. State taxes \$1,741.73, county taxes \$15,674.20, school taxes \$4,424.80. Live stock—Horses 1,162, mules 380, cattle 4,369, hogs 8,264, sheep 1,213. Public schools 39, white 20, colored 19. Churches 29.

PERQUIMANS.

Perquimans county is in every respect twin to the preceding, and northward it extends into the Great Dismal swamp. A considerable percentage of the surface of Perquimans is occupied by what is commonly called swamp land, though for the most part it is drainable and cultivable. These swamp lands, which are better described as semi-swamps and oak and pine flats, are a repetition of those before described, and have a similar soil, which varies from a fine gray loam to a dark mucky soil of high fertility. Along the Perquimans river, which is an arm of Albemarle sound, lie in a southeasterly direction narrow zones of cypress swamps, beyond which, northward and southward, are narrow tracts of sandy soil, with forests mainly of long-leaf pine. These long-leaf pine tracts, which occupy the divides between the streams, project in the form of promontories into the margin of the sound. Of the county area, 34.15 per cent. is tilled land, of which 13.12 per cent. is cultivated in cotton. Shipments are by sound and canal steamers and by rail to Norfolk.

Population 9,466.—White 4,795, colored 4,671. Area 245 square miles, woodland 61,482 acres. Tilled lands 53,544 acres, area planted in cotton 7,025 acres, in corn 21,910 acres, in wheat 2,957 acres, in oats 1,222 acres. Cotton production 2,778 bales, average cotton product per acre 0.40 bale, 564 pounds seed-cotton, or 188 pounds cotton lint. Real property,

aggregate value \$765,119, personal property \$399,121, total \$1,164,320. State taxes \$692, county taxes \$7,494.75, school taxes \$3,400.16. Live stock—Horses 1,291, mules 486, cattle 4,908, hogs 11,362, sheep 3,002. Public schools 46, white 28, colored 18. Churches 12.

CHOWAN.

Chowan county lies in the angle of the Chowan river and Albemarle sound. Northward it consists of sandy, upland piny woods, except narrow tracts along the river and some of its tributaries, where cypress swamps of considerable extent are found; and there are also large areas of oak flats. The southern portion of the county, lying near the sound and south of the Yeopim river, is characterized by a gray clay-loam soil and a mixed oak and pine forest growth, and is for the most part very productive. Bear Swamp, which crosses the county in a northeast and southwest direction, is more properly a semi-swamp from 3 to 5 miles wide, very level, with a gray silty soil, and the characteristic growth of such lands comprises short-leaf pine, oaks, maple, ash, dogwood, occasionally cypress and gum, and frequently a large admixture of holly, which here attains the size of oaks and furnishes a superior cabinet wood. The agriculture of the county, as well as its other industries, is quite like that of Gates. Its fisheries are among the largest and most profitable in the country. Of the county area 36.72 per cent. is tilled land, of which 17.16 per cent. is cultivated in cotton. Being surrounded on three sides by navigable waters and crossed by a line of railway, the county has abundant means of transportation.

Population 7,900—White 3,633, colored 4,267. Area 150 square miles, woodland 44,446 acres. Tilled lands 35,234 acres, area planted in cotton 6,047 acres, in corn 13,877 acres, in wheat 622 acres, in oats 791 acres. Cotton production 2,223 bales, average cotton product per acre 0.37 bale, 525 pounds seed-cotton, or 175 pounds cotton lint. Real property, aggregate value \$641,996, personal property \$303,585, total \$945,581. State taxes \$891.46, county taxes \$6,107.42, school taxes \$2,978.55. Live stock—Horses 794, mules 418, cattle 2,707, hogs 10,305, sheep 523. Public schools 28, white 16, colored 12. Churches 16.

DARE.

The surface of Dare county is mainly water, the land, made up of a succession of long, narrow islands and peninsulas, being interpenetrated throughout by great bays, sounds and navigable bayous. The county is bounded eastward by the Atlantic ocean, westward by Alligator river and southward by Pamlico sound. The larger portion, on the main-land, is a swamp, which lies but a few feet above tide-level. Around the margins of this portion, next the sound, are narrow tracts of a few miles, in places, of drainable, cultivable land belonging to the general description of oak flats, having a gray-loam soil of a close texture. It is also fringed by considerable bodies of marsh land next the sound, from which large crops of cranberries are gathered. Roanoke island, a part of this county, lies within the upper portion of Pamlico sound, and is a narrow tract, twelve miles in length and from two to three miles in width. The upper portion is for the most part sandy, with a short-leaf pine growth, intermixed with oaks, and the southern half is mainly swamp and marsh. The easternmost part of the county, like the corresponding portion of Currituck, is a narrow fringe of sand reef, properly a dune, which, as in the former case, was originally covered with a forest of short-leaf pine, oaks, hickories, dogwood, etc., with abundance of grape-vines. These have for the most part disappeared, leaving a tract of sand waves, which are moving, under the impact of the trade winds, constantly toward the southwest into the sound, and sometimes rise to a height of more than 100 feet. There is very little tillable land in the county. Its chief industry is, of course, fishing. Of the county area, only 0.86 per cent. is tilled land, of which 7.63 per cent. is cultivated in cotton.

Population 3,243—White 2,875, colored 368. Area 382 square miles, woodland 19,996 acres. Tilled lands 2,094 acres, area planted in cotton 16 acres, in corn 956 acres, in wheat 25 acres, in oats 17 acres. Cotton production 8 bales, average cotton product per acre 0.50 bale, 714 pounds seed-cotton or 238 pounds cotton lint. Real property, aggregate value \$135,594, personal property \$97,114, total \$232,738. State taxes \$118.55, county taxes \$2,868.59, school taxes \$729.67. Live stock—Horses 462, mules 20, cattle 1,951, hogs 3,030, sheep 1,754. Public schools 14, white 14. Churches 10.

TYRRELL.

The description of Tyrrell county may be given by simply repeating that of Washington, except that the great intersound swamp extends over a larger part of the county. Its northern third, lying on Albemarle sound, resembles in all its features the corresponding portion of Washington. No part of it rises 20 feet above sea-level. It is bounded on the east by the great projection from Albemarle sound known as Alligator river, which has a depth nearly equal to that of the sound and a breadth of from three to five miles. A portion of the rich border land of Lake Phelps lies within this county. In the southeastern corner, along Alligator river and its tributaries, and on the western side, these lands are semi-swamps and oak flats, and have a gray silt and clay loam soil. Of the county area, 7.98 per cent. is tilled land, of which 18.11 per cent. is cultivated in cotton.

Population 4,545—White 3,110, colored 1,435. Area 376 square miles, woodland 57,282 acres. Tilled lands 19,225 acres, area planted in cotton 3,481 acres, in corn 8,300 acres, in wheat 261 acres, in oats 781 acres. Cotton production 1,123 bales, average cotton product per acre 0.32 bale, 459 pounds seed-cotton, or 153 pounds cotton lint. Real property, aggregate value \$398,578, personal property \$248,465, total \$647,043. State taxes \$296.82, county taxes \$3,702.26, school taxes \$1,714.42. Live stock—Horses 404, mules 318, cattle 4,123, hogs 5,914, sheep 1,475. Public schools 19, white 13, colored 6. Churches 10.

WASHINGTON.

Washington county lies on the southern shore of Albemarle sound and Roanoke river, and extends southward into the great intersound, or Alligator swamp. Only about one-half its territory, next to Albemarle sound, has been brought into cultivation to any extent, the southern half remaining in its original condition. The cultivable portion consists mainly of oak flats, having a close gray clay loam soil and a growth of oak, hickory, beech, maple, and short-leaf pine, with flattish ridges here and there which have an intermixture of long and short-leaf pine and sandy loam soils. The former are generally quite fertile. The southern portion of the county is swampy, and is characterized by the presence of two considerable lakes, Phelps and Pungo, which occupy the highest

portions of the swamp, and from which many of the streams of the county take their rise. Around the margins of these lakes are narrow belts or ridges of swampy, mucky land, which were originally covered by heavy forests of gum, ash, maple, cypress, poplar, etc. The soils are of great depth and indefinite fertility. Much of the swamp land of this portion of the county is peaty and worthless, except for timber. The southwestern section consists partly of semi-swamps, with gray, fertile loams, and partly, in the "Longacre" country, of *pocosons*, with a small growth of pine and scrub oaks, very flat, with an ashen soil of close texture, silicious, but as impervious as clay. Of the county area, 12.56 per cent is tilled land, of which 26.43 per cent. is cultivated in cotton.

Population 8,928—White 4,554, colored 4,374. Area 382 square miles, woodland 75,816 acres. Tilled lands 30,711 acres, area planted in cotton 8,117 acres, in corn 15,824 acres, in wheat 647 acres, in oats 1,065 acres. Cotton production 3,524 bales, average cotton product per acre 0.43 bale, 618 pounds seed-cotton, or 206 pounds cotton lint. Real property, aggregate value \$530,031, personal property \$354,225, total \$884,256. State taxes \$754,96, county taxes \$3,776.95, school taxes \$3,217.24. Live stock—Horses 835, mules 328, cattle 4,050, hogs 9,141, sheep 1,050. Public schools 46, white 29, colored 17. Churches 17.

HYDE.

Hyde county is enveloped by sounds and great bay-like rivers, and its middle portion is occupied by a large lake, Mattamuskeet, 20 miles in length and 6 miles wide, with two other lakes in its northern portion. Two-thirds of its land-surface is occupied by the great Alligator swamp. A narrow fringe of from 1 to 2 miles' width around the central lake is the highest portion of the county, and is from 6 to 10 feet above tide. It was originally covered with a heavy swamp growth of cypress, gum (tupelo), maple, ash, etc. These lands have been cultivated for a century, and still produce 50 bushels of corn to the acre without manure or rotation. This ridge slopes off in every direction from the lake—eastward into a tract of oak flats which extends to the sound. The southwestern portion of the county within the projecting arms of Pungo river, and other bays from Pamlico sound may also be described as oak flats, with a soil which, in general terms,

is a gray silty loam—an admirable wheat soil. The northern portion of this county, throughout its whole extent from east to west, is a low-lying savanna or peaty cypress and juniper swamp, like the Great Dismal, called Alligator swamp. Of the county area 9.02 per cent. is tilled land, of which 7.81 per cent. is cultivated in cotton. The productions of this county are chiefly corn and wheat, to which has been recently added rice. Lumbering and fishing complete the list of its industries.

Population 7,765—White 4,424, colored 3,341. Area 557 square miles, woodland 41,247 acres. Tilled lands 32,167 acres, area planted in cotton 2,513 acres, in corn 21,632 acres, in wheat 1,079 acres, in oats 1,354 acres. Cotton production 718 bales, average cotton product per acre 0.29 bale, 408 pounds seed-cotton, or 136 pounds cotton lint. Real property, aggregate value \$442,227, personal property \$394,231, total \$836,458. State taxes \$257.68, county taxes \$5,029.62, school taxes \$2,443.44. Live stock—Horses 1,143, mules 204, cattle 6,451, hogs 9,210, sheep 1,728. Public schools 47, white 31, colored 16. Churches 25.

BEAUFORT.

Beaufort county lies south of Washington county, on both sides of the Pamlico river, which, in this part of its course, is an arm of the sound of the same name, from 2 to 6 miles wide, and throws off several wide projections or bays into the county on both sides. It is bounded on the east by Pungo river, another broad arm of Pamlico sound, whose waters also penetrate the county in numerous wide navigable bayous. A considerable proportion of the county is occupied by swamp lands. In the northern section, and across its whole breadth, lies the western extremity of the great intersound swamp, which attains its greatest elevation here of 40 feet above tide. In this culminating swell, between the Roanoke and Pamlico rivers, rise numerous tributaries of these rivers and of the sounds. The central portion of this part of the swamp belongs to that class of soils described as "pocoson," and is of very low fertility. Along the courses of the streams, as they flow out from this swell, are considerable marginal tracts of semi-swamp and oak flats, which are very productive. There are also belts of cypress swamp near Pamlico river and the other streams on both sides, and south of the swamp, in the middle as well as along the western edge of the county, the land is mostly a level piny

woods, with a light sandy soil. In the eastern portion of the county, and on both sides of the Pamlico river, both along the banks of this river and of the before-mentioned projections, are large tracts of oak flats and semi-swamp, which are among the most productive soils of the region. Near the mouth of Pungo river occurs one of the largest prairies or natural meadows, *Savannas*, in the State, embracing an area of 1,200 or 1,500 acres. It is treeless and fringed by short leaf pine and oak forests, and has a fine, close, gray sandy soil, as impervious as clay. Its subsoil is of the same character, but is more clayey, and is of a slightly yellowish color. Marl is found in various parts of the county, but is little used. Of the county area, 10.99 per cent is tilled land, of which 27.01 per cent is cultivated in cotton.

Population 17,474—White 10,022, colored 7,452. Area 620 square miles, woodland 224,330 acres. Tilled lands 43,625 acres, area planted in cotton 11,785 acres, in corn 20,225 acres, in wheat 374 acres, in oats 1,395 acres. Cotton production 6,021 bales, average cotton product per acre 0.51 bale, 729 pounds seed-cotton or 243 pounds cotton lint. Real property, aggregate value \$1,410,636, personal property \$837,706, total \$2,248,342. State taxes \$1,899.59, county taxes \$14,627.76, school taxes \$5,957.47. Live stock—Horses 1,456, mules 654, cattle 10,109, hogs 21,245, sheep 5,257. Public schools 62, white 36, colored 26. Churches 27.

PAMLICO.

Pamlico county is bounded on the east by Pamlico sound, and is enveloped by two of its great arms, Pamlico and Neuse rivers. Another of these arms, Bay river, with its numerous bayous, penetrates the central portion of the county, and nearly its whole border is deeply indented by smaller projections from the sound. A large part of the county consists of swamp lands with extensive oak and beech flats. These soils are very rich. Cotton is a leading crop in this county. There is a narrow belt of sandy, piny woods crossing the county diagonally from the southeastern angle at Wilkinson's Point to Durham's creek in the northwestern corner. Of the county area, only 5.65 per cent. is tilled land, of which 25.20 per cent. is cultivated in cotton.

Population 6,323—White 4,207, colored 2,116. Area 470 square miles, woodland 86,574 acres. Tilled lands 16,989

acres, area planted in cotton 4,585 acres, in corn 6,381 acres, in wheat 285 acres, in oats 378 acres. Cotton production 2,226 bales, average cotton product per acre 0.49 bale, 693 pounds seed-cotton, or 231 pounds cotton lint. Real property, aggregate value \$326,115, personal property \$184,531, total \$510,646. State taxes \$369.47, county taxes \$7,309.57, school taxes \$2,149.37. Live stock—Horses 571, mules 180, cattle 3,425, hogs 7,971, sheep 1,582. Public schools 40, white 23, colored 17. Churches 15.

CRAVEN.

Craven is a large, straggling county, stretching 60 miles along the lower reaches of the Neuse river, which passes through its centre and drains its entire area. The physical description of its territory, especially the southern and eastern sections, is identical with that of the two preceding counties. It consists largely of swamps, pocoson, and oak flats. The section lying north of the Neuse river belongs for the most part in its agricultural features to the second subdivision, or long leaf pine belt, having considerable tracts of pine flats and long-leaf pine ridges, with a soil often very sandy and unproductive. Near its upper margin it is penetrated by considerable tracts of swamp and semi-swamp lands, which project southward from Pamlico river and form properly the western extension of Bay River swamp. Along the southern shore of Neuse river the soil is mainly a close gray loam. The Great Dover Pocoson, occupying more than 100 square miles in its southwestern angle, is elevated 60 feet above tide in its central part, and is very flat and sterile for the most part, but has strips of oak and pine flats radiating in all directions from the centre along the numerous streams. Of the county area 9.68 per cent. is tilled land, of which 25.25 per cent. is cultivated in cotton.

Population 19,729—White 6,664, colored 13,065. Area 820 square miles, woodland 197,135 acres. Tilled lands 50,853 acres, area planted in cotton 12,838 acres, in corn 19,001 acres, in wheat 235 acres, in oats 333 acres. Cotton production 5,782 bales, average cotton product per acre 0.45 bale, 642 pounds seed-cotton, or 214 pounds cotton lint. Real property, aggregate value \$1,625,960, personal property \$638,046, total \$2,364,206. State taxes \$2,566.92, county taxes \$34,679.08, school taxes \$7,076.37. Live stock—Horses 1,063, mules 528, cattle 743, hogs 9,542, sheep 2,302. Public schools 63, white 28, colored 35. Churches 30.

CARTERET.

Carteret county occupies a long strip of country south of Craven county and of Pamlico sound, and is bounded southward by the Atlantic ocean. It is traversed east and west through the middle by a succession of swamps, the largest of which, occupying its eastern peninsular projection, is called the Open Ground Prairie swamp. This is a peat swamp, quite barren in its middle parts, but fringed around its margin with oak flats and gray silty soil. There is also a line of sand islands (sand dunes) along the coast, and inland, parallel to the coast, are several ridges of long-leaf pine, sandy lands. The highest part of the county is only 37 feet above tide. Carteret has the advantage of the best harbor on the coast of this State. Of the county area, 6.90 per cent. is tilled land, of which 16.33 per cent. is cultivated in cotton.

Population 9,784—White 7,107, colored 2,677. Area 407 square miles, woodland 67,211 acres. Tilled lands 17,984 acres, area planted in cotton 2,936 acres, in corn 5,156 acres, in wheat 418 acres, in oats 107 acres. Cotton production 1,014 bales, average cotton product per acre 0.35 bale, 492 pounds seed-cotton, or 164 pounds cotton lint. Real property, aggregate value \$466,403, personal property \$243,587, total \$709,990. State taxes \$615.13, county taxes \$5,624.83, school taxes \$2,497.12. Live stock—horses 1,060, mules 106, cattle 5,512, hogs 4,206, sheep 1,504. Public schools 33, white 24, colored 9. Churches 17.

JONES.

The great tract of swamp land which lies between the Neuse river and the Atlantic ocean and extends through a considerable portion of the two preceding counties projects westward into Jones county, where it reaches its highest elevation of 40 feet, and is crowned by a chain of small lakes of from 1 to 3 or 4 miles diameter on the summit, on the border of Jones and Carteret counties. The northern border of the county is occupied by a portion of the great Dover pocoson, which projects into it from Craven. In its middle and southern sections lies a great part of the great White Oak swamp, the central portion of which is also a pocoson; but it is margined about with fringes of canebrake lands, white-oak flats and cranberry marshes, as well as by considerable tracts of swamp lands covered with oak, cypress, gum, poplar, ash, etc. Trent river

flows through the centre and, with its tributaries, drains almost its entire area. Along this river on both sides are considerable bodies of long-leaf pine sandy lands. There are also along the main river, as well as its tributaries, narrow strips of oak flats and occasional gum and cypress swamps. The county resembles, therefore, very closely the two last described in physical features and in products and industries. Of the county area, 21.47 per cent. is tilled land, of which 15.83 per cent. is cultivated in cotton.

Population 7,491—White 3,212, colored 4,279. Area 389 square miles, woodland 134,598 acres. Tilled land 53,458 acres. area planted in cotton 8,463 acres, in corn 19,425 acres, in wheat 429 acres, in rye 245 acres, in oats 455 acres. Cotton production 4,078 bales, average cotton product per acre 0.48 bale, 687 pounds seed-cotton or 229 pounds cotton lint. Real property, aggregate value \$520,269, personal property \$99,045, total \$619,314. State taxes \$223.63, county taxes \$6,072.49, school taxes \$3,285.47. Live stock—Horses 710, mules 536, cattle 3,433, hogs 10,298, sheep 2,675. Public schools 66, white 22, colored 44. Churches 13.

ONSLOW.

The identical terms used in the description of the preceding county might be repeated for Onslow. Nearly one-half of the White Oak swamp lies in its northern section, and from it flow most of the streams by which the county is drained. The best agricultural lands of the county lie along the margin of this swamp. A great part of it is drained southward into New river, which traverses the entire length of the county from north to south. This river, for one-half of its length, is a broad, navigable bay, from 1 to 2 miles wide, and is famous for its fine oysters and fish. On both sides of it are large tracts of upland piny woods, with a gray sandy soil, which are admirably adapted to the production of cotton. Nearer the sea-coast and its fringe of sounds the soils are more sandy, and are covered with long-leaf pines as their principal growth, a similar large tract occupying its northwestern section. There are numerous narrow fringes of cypress swamps along the various streams. A portion of the southwestern side of this county is penetrated by the Holly Shelter pocoson. The productions of this county are similar to those of the preceding. Of the county area, 13.59 per cent. is tilled land, of which 11.86 per cent. is cultivated in cotton.

Shipping is done by way of New river, which is navigable to the middle of the county.

Population 9,829—White 6,600, colored 3,229. Area 645 square miles, woodland 212,866 acres. Tilled lands 56,120 acres, area planted in cotton 6,658 acres, in corn 23,259 acres, in oats 96 acres. Cotton production 2,841 bales, average cotton product per acre 0.43 bale, 609 pounds seed cotton or 203 pounds cotton lint. Real property, aggregate value \$668,745, personal property \$900,114, total \$1,568,859. State taxes \$200.31, county taxes \$4,292.90, school taxes \$2,975.42. Live stock—Horses 755, mules 566, cattle 6,543, hogs 18,760, sheep 5,364. Public schools 65, white 40, colored 25. Churches 19.

PENDER.

Pender county, like the preceding, is bounded in part on the south by the Atlantic ocean, with its fringe of sounds, marshes, and dunes, and is drained southward by the waters of the Northeast Cape Fear river. Holly Shelter pocoson occupies a large part of the southeastern section, and from it flow numerous creeks into the above-mentioned river, while others flow directly into the Atlantic. The central portion and larger part of this great pocoson, which contains about 100 square miles, is quite barren, but around its margin, especially toward the river, are considerable tracts of white-oak flats, canebrake, and swamp lands, with their characteristic growths and soils. In the northeastern section lies the half of another similar pocoson nearly as large, called Angola bay, and in the the centre of the western half of the county is a third but much smaller swamp of the same general character. The western side of the county for the breadth of from six to eight miles belongs to the region of upland piny woods, the principal growth being long-leaf pines, with an undergrowth of oaks, hickory, dogwood, etc., and a sandy soil; but some of it approaches the character of the regular "sand-hills," with pine and oak flats here and there. Along the streams are generally alluvial belts or swamps and oak flats, which are the corn lands of the county. A savanna of several square miles is found in the upper end of the county, which merges northward into a barren pocoson of still greater extent. Marl abounds in all parts of the county, and Eocene limestone is found along the principal river above named. These add greatly to its agricultural advantages.

The cotton product is inconsiderable; the remaining products are corn, rice, potatoes, lumber and naval stores.

Of the county area, 6.71 per cent. is tilled land, of which 3.83 per cent. is cultivated in cotton.

Cotton and other products are shipped to Wilmington and Norfolk by rail, or to the former by the two Cape Fear rivers, which form the boundaries east and west.

Population 12,468—White 5,509, colored 6,959. Area 889 square miles, woodland 287,700 acres. Tilled lands 38,156 acres, area planted in cotton 1,463 acres, in corn 16,550 acres, in wheat 7 acres, in oats 183 acres. Cotton production 835 bales, average cotton product per acre 0.57 bale, 813 pounds seed-cotton, or 271 pounds cotton lint. Real property, aggregate value \$939,111, personal property \$326,304, total \$1,263,415. State taxes \$422.91, county taxes \$7,689.90, school taxes \$3,922.42. Live stock—Horses 665, mules 401, cattle 6,446, hogs 16,465, sheep 5,369. Public schools 62, white 24, colored 38.

NEW HANOVER.

New Hanover is one of the smallest counties in the State, and consists of a narrow triangular wedge between the Cape Fear river on the west and the Atlantic coast on the east, with its narrow fringe of sounds, marshes, and dunes. The margins of the streams and sounds are bordered in many places by narrow strips of oak and pine flats with a gray silty soil. The central portion of the county, as well as the dunes along the shore, are sandy and unproductive; but there are tracts of alluvial and swamp-land river bottoms along the Cape Fear which produce large crops of rice. The county contains the largest city in the State, Wilmington (population nearly 20,000). It is also the most important seaport, and has a large foreign as well as inland trade in lumber, naval stores, and cotton, both by means of its railways and navigable rivers. Of the county area 6.35 per cent. is tilled land, of which 1.92 per cent. is cultivated in cotton.

Population 21,376—white 8,159, colored 13,217. Area 182 square miles, woodland 39,603 acres. Tilled lands 7,396 acres, area planted in cotton 142 acres, in corn 2,008 acres, in oats 86 acres. Cotton production 66 bales, average cotton product per acre 0.46 bale, 663 pounds seed-cotton, or 221 pounds cotton lint. Real property, aggregate value \$3,709,967, personal

property \$1,594,603, total \$5,304,372. State taxes \$8,785.24, county taxes \$25,550 02, school taxes \$14,574.36. Live Stock—Horses 661, mules 187, cattle 1,989, hogs 2,485, sheep 123. Public schools 24, white 9, colored 15. Churches 31.

BRUNSWICK.

Brunswick county lies on the west side of the Cape Fear river, and touches the Atlantic on the south. Its central and western portion is occupied by the great pocoson known as Green swamp, which, with its many projections, covers nearly half of the territory of the county. This swamp is bordered by wide tracts of canebrakes, and contains extensive areas of gum, cypress and juniper swamps, which have been for half a century the centre of a large lumber trade. The various streams which flow from this swamp to all points of the compass are bordered by oak flats, tracts of semi-swamp, and often by canebrakes, and in the body of it are numerous hummocks or flat ridges having a silty soil and a growth of short-leaf pine and small oaks. Between the arms of the swamp, on the narrow divides, and particularly in the southern portion of the county, near the seashore, are patches of long-leaf pine lands with sandy soils, and elsewhere of level piny woods, valuable for lumber and naval stores. Along the Cape Fear are large bodies of alluvial lands of unsurpassed fertility, which are among the best rice soils in this country. Waccamaw lake occupies the highest part of Green swamp, and covers an area of about 40 square miles. Naval stores and lumber are, of course, the principal interests, agriculture being of subordinate importance, and limited mainly to the cultivation of rice, of which its product is more than double that of any other county in the State. Of the county area, 3.46 per cent. is tilled land, of which 2.14 per cent. is cultivated in cotton.

Population 9,389—White 5,337, colored 4,052. Area 814 square miles, woodland 304,722 acres. Tilled lands, 18,006 acres, area planted in cotton 385 acres, in corn 4,915 acres, in wheat 8 acres, in oats 240 acres. Cotton production 244 bales, average cotton product per acre 0.63 bale, 903 pounds seed-cotton or 301 pounds cotton lint. Real property aggregate value \$639,682, personal property \$326,777, total \$966,459. State taxes \$388.38, county taxes \$5,235.37, school taxes \$2,995.10. Live stock—Horses 319, mules 185, cattle 7,742, hogs 13,177, sheep 5,568. Public schools 56, white 37, colored 19. Churches 9.

COLUMBUS.

Columbus county lies farther inland, and contains a larger proportion of upland piny woods soil than Brunswick. It is penetrated through all its parts by narrow belts of gum and cypress swamp and considerable tracts of oak and pine flats. The average soil of its upland piny woods is of moderate fertility, well adapted to the growth of cotton, but the richer swamp and gray-loam lands are devoted principally to corn. Brown marsh and White marsh are two large bodies of swamp in the eastern side of the county, and Gum swamp and others of less extent are found in the south and west. The production of cotton, potatoes and rice divides with lumber and naval stores the interest of its people. Marl is found in several parts of the county. Of the county area 6.69 per cent is tilled land, of which 5.52 per cent. is cultivated in cotton.

Population 14,439—White 8,926, colored 5,513. Area 895 square miles, woodland 357,014 acres. Tilled lands 38,293 acres, area planted in cotton 2,153 acres, in corn 15,723 acres, in wheat 38 acres, in oats 267 acres. Cotton production 930 bales, average cotton product per acre 0.44 bale, 627 pounds seed cotton or 209 pounds cotton lint. Real property, aggregate value \$843,317, personal property \$823,158, total \$1,666,475, State taxes \$1,060.56, county taxes \$6,857.21, school taxes \$5,833.44. Live stock—Horses 599, mules 492, cattle 9,290, hogs 27,243, sheep 11,143. Public schools 83, white 54, colored 29, churches 27.

LONG-LEAF PINE REGION.

(Embraces the following counties and parts of counties: Gates, Hertford, Bertie, Northampton, Halifax, Nash, Edgecombe, Pitt, Greene, Martin, Wilson, Johnston, Wayne, Lenoir, Duplin, Sampson, Cumberland, Harnett, Moore, Richmond, Robeson and Bladen).

GATES.

Gates county lies between the Chowan river and the Dismal swamp, of which it includes a considerable section. The body of the county consists of level piny uplands, with a

sandy loam soil. It has a narrow strip of very sandy, long-leaf pine land near the Chowan river, and also in the southeastern corner of the county. Along the Chowan river and its tributaries are tracts of cypress swamp from 1 to 2 and 3 miles wide. Near the smaller streams are narrow tracts of pine and oak flats having a gray clay loam soil. Marl is found in the banks of the Chowan river and in the southern end of the county. Of the county area, 22.50 per cent. is under tillage, of which 11.69 per cent. is cultivated in cotton.

Population 8,897—White 4,973, colored 3,924. Area 339 square miles, woodland 101,616 acres. Tilled lands 48,821 acres, area planted in cotton 5,707 acres, in corn 21,946 acres, in wheat, 708 acres, in oats 1,210 acres. Cotton production 1,863 bales, average cotton product per acre 0.33 bale, 465 pounds seed cotton, or 155 pounds cotton lint. Real property, aggregate value \$579,187, personal property \$483,762, total \$1,062,949. State taxes \$692.73, county taxes \$3,573.18, school taxes \$3,203.26. Live stock—Horses 1 358, mules 3,888, cattle 5,713, hogs 14,429, sheep 3,160. Public schools 39, white 25, colored 14. Churches 16.

HERTFORD.

Hertford county lies on the northern border of the State, and is bounded eastward by the Chowan river. The soils are for the most part of the general region of upland pine woods lands, but near the water-courses there are considerable tracts of oak and pine flats and alluvial land. Along the margin of the Chowan and some of the other water-courses are fringes of gum and cypress swamp. Marl in abundance underlies the surface. Besides the culture of cotton and corn, there are the fish, lumber and naval-stores industries. Of the county area, 22.28 per cent. is tilled land, of which 27.24 per cent. is cultivated in cotton. Cotton, lumber, and other products are shipped by steamer and rail to Norfolk.

Population 11,843—White 5,122, colored 6,721. Area 376 square miles, woodland 119,330 acres. Tilled lands 53,625 acres, area planted in cotton 14,605 acres, in corn 25,521 acres, in wheat 817 acres, in oats 1,800 acres. Cotton production 6,360 bales, average cotton product per acre 0.44 bale, 621 pounds seed cotton, or 207 pounds cotton lint. Real property, aggregate value \$1,068,598, personal property \$753,617, total \$1,822,215. State taxes \$1,301.50, county taxes \$7,117.00.

school taxes \$6,072.91. Live stock—Horses 1,395, mules 593, cattle 4,421, hogs 14,529, sheep 2,149. Public schools 56, white 30, colored 26. Churches 15.

BERTIE.

Bertie county lies south of Hertford, in the angle between Roanoke and Chowan rivers, and consists for the most part of level piny uplands, having a sandy loam soil; but the northern part of it is largely pine flats, having an infertile ash-colored, fine sandy soil. The southern part, near the Roanoke river, and along its chief tributary, the Cashie, are wide tracts of level oak and pine lands, which are very productive. The Roanoke river through almost the whole length of this county is bordered by a tract of alluvial lands from 3 to 6 miles wide, subject to annual overflows, and covered with heavy forests of cypress, maple, ash, &c., which are among the most fertile of the continent. In the middle region, on and near the Cashie and its tributaries, are considerable bodies of valuable swamp and semi-swamp lands. Cotton, corn, potatoes, fish and lumber, make up the list of industries of this county. Marl is found the southern and middle sections. Of the county area, 18.68 in per cent. is in tilled land, of which 23.62 per cent. is cultivated in cotton.

Population 16,399—White 6,815, colored 9,584. Area 689 square miles, woodland 184,070 acres. Tilled lands 82,377 acres, area planted in cotton 19,455 acres, in corn 37,735 acres, in wheat 309 acres, in oats 2,403 acres. Cotton production 7,290 bales, average cotton product per acre 0.37 bale, 534 pounds seed-cotton, or 178 pounds cotton lint. Real property, aggregate value \$1,444,183, personal property \$732,734, total \$2,176,917. State taxes \$1,792.59, county taxes \$7,387.85, school taxes \$6,947.31. Live stock—Horses 1,845, mules 1,011, cattle 9,015, hogs 23,219, sheep 5,768. Public schools 79, white 46, colored 33. Churches 21.

NORTHAMPTON.

Northampton county is situated between the Virginia border and the Roanoke river. Its soils belong to the general region of level piny uplands, merging toward the western limit into oak uplands and a more hilly surface, with an elevation of 150

feet above sea-level. Its numerous streams have general fringes of oak flats, alluvions, or gum and cypress swamps, and the Roanoke river has in its extensive "bottoms" some of the best corn lands in the State. Of the county area 27.09 per cent is tilled land, of which 37.51 per cent. is cultivated in cotton.

Population 20,032—White 7,987, colored 12,045. Area 557 square miles, woodland 144,779 acres. Tilled lands 96,565 acres, area planted in cotton 36,219 acres, in tobacco 36 acres, in corn 45,224 acres, in wheat 1,725 acres, in oats 4,805 acres. Cotton production 13,616 bales, average cotton product per acre 0.38 bale, 537 pounds seed-cotton, or 179 pounds cotton lint. Real property, aggregate value \$1,780,607, personal property \$980,420, total \$2,716,027. State taxes \$1,429.09, county taxes \$8,054.74, school taxes \$8,266 53. Live stock—Horses 2,358, mules 979, cattle 6,538, hogs 22,089, sheep 2,606. Public schools 56, white 26, colored 30. Churches 18.

HALIFAX.

Halifax county lies between the Roanoke river on the north and Fishing creek, one of the confluent of the Tar river, on the south. The eastern and larger part of this county belongs to the normal type of upland piny woods, the western third to the oak uplands. Long-leaf and short-leaf pines are commonly mingled with a subordinate growth of oaks, hickory, dogwood, etc. The surface is generally level or a little rolling, with small, often abrupt, hills and ravines near the streams. The soil is a gray, sandy loam, with a yellow to brown subsoil. The creeks and larger streams nearly all flow southward into the Tar river, the water-shed, according to a curious topographical law previously referred to, lying quite close to the south bank of the Roanoke. The western section belongs in large part to the oak uplands region, having its characteristic gray, yellow, and reddish clay loam and sandy loam soils and rolling surface and predominant oak forests, with an intermixture of short-leaf pine. The crops of this section are largely grains (corn, wheat, etc.) and tobacco. The bulk of the cotton product is made in the eastern section.

The streams in the eastern section have often narrow, swampy tracts of gum and cypress along their margins, but there are extensive alluvial areas or bottoms on the larger rivers, especially the Roanoke, whose bottoms are of unsurpassed fertility.

In the great bend of Scotland Neck are some of the finest cotton lands of the State. Marl is abundant in the middle and eastern sections. Halifax is one of the most prosperous cotton counties, and produces very large crops of grains besides, chiefly of corn, of which the product is nearly half a million bushels. Of the county area 32.12 per cent. is tilled land, of which 33.18 per cent. is cultivated in cotton.

Population 30,300—White 9,137, colored 21,163. Area 682 square miles, woodland 178,508 acres. Tilled lands 130,219 acres, area planted in cotton 43,206 acres, in corn 44,790 acres, in wheat 1,300 acres, in oats 4,497 acres. Cotton production 16,661 bales, average cotton product per acre 0.39 bale, 549 pounds seed-cotton, or 183 pounds cotton lint. Real property, aggregate value \$2,448,140, personal property \$1,117,318, total \$3,565,458. State taxes \$2,539.40, county taxes \$19,936.73, school taxes \$11,119.81. Live stock—Horses 2,313, mules 1,650, cattle 9,987, hogs 23,372, sheep 2,552. Public schools 62, white 24, colored 38. Churches 40.

NASH.

The general topographical and agricultural features of Nash county correspond quite closely to those of Halifax, to which its situation is similar. It lies south of that county, and also on the borders of the oak uplands, to which the western part of it belongs. It is drained for the most part by the Tar river and its numerous tributaries, along which are narrow strips of alluvial soil, with oak forests and occasional cypress swamps. The divides between these streams through the middle and eastern portions of the county belong to the region of level upland piny woods, the growth being a mixture of long-leaf and short-leaf pine, with oak, hickory, dogwood, etc. These soils are well adapted to the culture of cotton, and are of average fertility. The soils in many places in the western section are red or yellowish clay loams. This county lies largely within the area of the most productive cotton section of the State; the corn and potato crops are also important. Marl is abundant in the eastern part, but has not been extensively used. Of the county area 21.60 per cent. is tilled land, of which 31.33 per cent. is cultivated in cotton.

Population 17,731—White 9,417, colored 8,314. Area 595 square miles, woodland 193,247 acres. Tilled lands 82,238 acres, area planted in cotton 25,768 acres, in tobacco 27 acres,

in corn 32,490 acres, in wheat 3,787 acres, in oats 3,875 acres. Cotton production 12,567 bales, average cotton product per acre 0.49 bale, 696 pounds seed-cotton, or 232 pounds cotton lint. Real property, aggregate value \$1,798,295, personal property \$831,630, total \$2,629,925. State taxes \$900.54, county taxes \$11,031.38, school taxes \$7,598.45. Live stock—Horses 1,445, mules 1,274, cattle 6,485, hogs 21,674, sheep 5,879. Public schools 82, white 46, colored 36. Churches 19.

EDGECOMBE.

Edgecombe is a typical county of the long-leaf pine region. It is traversed through its middle portion by the Tar river, and is drained by its numerous tributaries. The soils are characteristically gray sandy loams, with a yellow to brown subsoil, and belong to the region of level piny uplands. Along the borders of the various streams are frequent and extensive tracts of alluvial lands, and on some of them occur cypress and gum swamps. This is one of the leading cotton counties of the State, and on the percentage cotton map it will be seen to occupy the centre of one of the zones of greatest production. It stands second among the counties of the State in its product of cotton, and its corn crop is also among the largest. The long-leaf pines, which were once found abundant over the whole surface of this county (and region) have been thinned until they are a subordinate element, so that the remaining forests are mainly of short-leaf pine and oak.

Both commercial fertilizers and the native marls have been more largely used than elsewhere in the State, and, in connection with compost, most effectively, so that Edgecombe has long been foremost in this special agriculture of the east. Of the county area, 36.62 per cent. is tilled land, 39.27 per cent. of the latter being cultivated in cotton. It has the advantage of both river and railroad transportation.

Population 26,181—White 7,968, colored 18,213. Area 567 square miles, woodland 125,083 acres. Tilled lands 132,875 acres, area planted in cotton 51,880 acres, in corn 46,235 acres, in wheat 2,422 acres, in oats 9,589 acres. Cotton production 26,250 bales, average cotton product per acre 0.51 bale, 720 pounds seed-cotton or 240 pounds cotton lint. Real property, aggregate value \$2,731,791, personal property \$1,762,750, total \$4,495,541. State taxes \$3,905.44. Live stock—Horses 1,821, mules 2,612, cattle 5,705, hogs 22,100, sheep 2,720. Public schools 57, white 20, colored 37. Churches 36.

PITT.

The description of Edgecombe county applies, with scarcely a change, to this county also. The only mentionable difference is that it contains perhaps a larger proportion of swampy lands, both along the Tar river and its main tributaries and the two Contentneas. The body of its area is the normal level, upland, pine woods, with their usual soils and forests. It is also one of the best cotton counties, and its grain crop is larger in proportion than that of most of the cotton counties, exceeding 500,000 bushels. Its product of rice and potatoes is also of considerable importance. Marl is abundant, and is used with the best results, as in Edgecombe. Of the county area, 24.57 per cent. is tilled land, and 30.15 per cent. of the latter is cultivated in cotton.

Population 21,794—White 10,794, colored 11,090. Area 657 square miles, woodland 217,222 acres. Tilled lands 103,302 acres, area planted in cotton 31,147 acres, in corn 46,482 acres, in wheat 3,787 acres, in rye 284 acres, in oats 3,301 acres. Cotton production 14,879 bales, average cotton product per acre 0.48 bale, 681 pounds seed cotton, or 227 pounds cotton lint. Real property, aggregate value \$1,903,191, personal property \$1,299,087, total \$3,202,278. State taxes \$2,223.22, county taxes \$11,602.29, school taxes \$10,520.01. Live stock—Horses 2,628, mules 1,593, cattle 9,809, hogs 32,571, sheep 2,683. Public schools 95, white 54, colored 41. Churches 36.

GREENE.

The small county of Greene, adjoining Pitt on the south, and drained by the Contentnea (which crosses it through the middle) and its numerous tributaries, has the same general features, both as to its natural characteristics and as to the development of its agriculture, as Edgecombe county, but there are considerable areas of sandy pine lands and pine flats in the eastern angle and in the southern section. Its streams are also for the most part bordered by narrow fringes of alluvial land and of gum and cypress swamps. It has also along the courses of some of its tributaries considerable tracts of semi-swamp land, characterized by a dark gray loam of great fertility, notably Lousin swamp, near the southern border. Like the preceding counties, Greene finds marl and compost essential to successful cotton farming. There are still considerable

areas of pine and cypress timber in the county. Of the county area, 45.65 per cent. is tilled land, of which 22.63 per cent. is cultivated in cotton.

Population 10,037—White 4,652, colored 5,385. Area 257 square miles, woodland, 82,432 acres. Tilled lands 75,084 acres, area planted in cotton 16,988 acres, in corn 25,148 acres, in wheat 3,638 acres, in rye 394 acres, in oats 1,738 acres. Cotton production 8,020 bales, average cotton product per acre 0.47 bale, 672 pounds seed-cotton, or 224 pounds cotton lint. Real property, aggregate value \$1,075,559, personal property \$625,865, total \$1,701,424. State taxes \$1,034.82, county taxes \$10,673.30, school taxes \$5,363.44. Live stock—Horses 1,096, mules 909, cattle 1,675, hogs 13,939, sheep 643. Churches 25.

MARTIN.

Martin county is bordered on the north by the very tortuous course of the Roanoke river, the tributary waters of which for the most part drain it northward into that river. The larger part of its territory belongs to the region of level pine uplands, having a gray sandy loam soil. The higher ridge land, near the south bank of the Roanoke river, has a soil lighter and more sandy, and is characterized by a considerable admixture of long-leaf pine, and the average proportion of oaks and short-leaf pine, etc. Along the Roanoke and some of its tributaries there are extensive bottoms or alluvial lands, and about the head streams of its tributaries considerable tracts of swamp land.

The agriculture of the county corresponds in its main features to that of Edgecombe and the adjacent counties, but its soils are less productive, and its agriculture is less advanced partly because of its large and profitable lumber industry in the great cypress swamps of the Roanoke. Marl is abundant and is used to a moderate extent. Of the county area 18.28 per cent. is tilled land, of which 23.67 is cultivated in cotton.

Population 13,140—White 6,661, colored 6,479. Area 482 square miles, woodland 175,116 acres. Tilled lands 56,377 acres, area planted in cotton 13,444 acres, in corn 24,209 acres, in wheat 940 acres, in oats 1,447 acres. Cotton production 6,383 bales, average cotton product per acre 0.47 bale, 678 pounds seed-cotton, or 226 pounds cotton lint. Real property, aggregate value \$1,177,891, personal property \$694,452, total

\$1,872,343. State taxes \$977.64, county taxes \$10,905.05, school taxes \$5,430.62. Live stock—Horses 1,189, mules 805, cattle 5,563, hogs 18,197, sheep 2,960. Public schools 59, white 35, colored 24. Churches 22.

WILSON.

Wilson county lies on the western border of the long-leaf pine belt, and its soils belong almost exclusively to the region of level upland piny woods, and correspond to those of Edgecombe. This county is traversed by numerous streams, the most notable of which is the Contentnea, along which, as well as its tributaries, are found considerable tracts of alluvial land and swamps (gum and cypress). In all respects the agriculture of this county repeats that of Edgecombe both as to practice and as to results. It will be seen, by reference to the cotton percentage map, that this territory also belongs to the region of highest production. Marl is found in the eastern half of the county. Of the county area, 27.12 per cent. is tilled land, of which 36.33 per cent. is cultivated in cotton.

Population 16,064—White 8,655, colored 7,409. Area 376 square miles, woodland 114,530 acres. Tilled lands 65,255 acres, area planted in cotton 23,706 acres, in corn 27,288 acres, in wheat 2,804 acres, in oats 1,590 acres. Cotton production 13,049 bales, average cotton product per acre 0.55 bale, 783 pounds seed-cotton, or 261 pounds cotton lint. Real property, aggregate value \$1,980,206, personal property \$1,463,224, total \$3,443,430. State taxes \$2,055.47, county taxes \$12,553.09, school taxes \$9,896.04. Live stock—Horses 1,388, mules 1,505, cattle 3,472, hogs 20,463, sheep 2,246. Public schools 68, white 40, colored 28. Churches 25.

JOHNSTON.

Johnston county lies on the upper waters of the Neuse river and its larger tributaries, which traverse it in a southeast direction, and consists for the most part of level and gently rolling piny uplands, with a few small bodies of more sandy and barren pine lands. It lies on the western margin of the long-leaf pine region, its southeastern half being characterized in its general features by the same soils and growth as the average of that belt, while along the northwestern margin the

lands are more hilly and the piny belts are alternated along the streams and more hilly portions with oak and pine forests and gravelly loam soils. There are tracts of quite sandy soil in the eastern section, while in the middle section are large bodies of pine flats. Johnston is one of the most prosperous counties, as besides its large cotton crops the grain product reaches nearly 500,000 bushels, and its crop of potatoes exceeds 200,000 bushels. Of the county area 23.68 per cent. is tilled land, of which 30.83 per cent. is cultivated in cotton.

Population 23,461—White 15,996, colored 7,645. Area 689 square miles, woodland 29,966 acres. Tilled lands 104,407 acres, area planted in cotton 32,193 acres, in tobacco 36 acres, in corn 45,045 acres, in wheat 3,711 acres, in rye 324 acres, in oats 3,176 acres. Cotton production 15,151 bales, average cotton product per acre 0.47 bale, 672 pounds seed cotton, or 224 pounds cotton lint. Real property, aggregate value \$2,641,219, personal property \$1,337,465, total \$3,978,684. State taxes \$1,971.22, county taxes \$14,999.78, school taxes \$10,696.48. Live stock—Horses 2,076, mules 1,891, cattle 9,900, hogs 40,373, sheep 8,684. Public schools 95, white 67, colored 28. Churches 46.

WAYNE.

Wayne county lies eastward of Johnston county, south of Wilson county, and west of Greene, on the waters of the Neuse, which crosses its middle portion and drains almost the whole of it directly and by its tributaries. This county resembles in all respects the adjoining counties already described. Along the Neuse river and some of the other streams are considerable bodies of alluvial land and semi-swamp, and not infrequently fringes of cypress and gum swamp. Along the south bank of the Neuse is a narrow zone of pine barrens, conforming in its general trend to the curves of that river, and having a breadth of from 1 to 3 miles. Both this county and Johnston have still considerable areas of turpentine and timber lands.

The cotton and grain products of Wayne county are large, and those of rice and potatoes are considerable. There is an abundance of marl, and it has been used very profitably in former years; but latterly, as in the cotton region generally, commercial fertilizers have usurped the place of nearly all others. Of the county area 31.74 per cent. is tilled land, of which 26.29 per cent. is cultivated in cotton.

Population 24,951—White 12,827, colored 12,124. Area 601 square miles, woodland 188,130 acres. Tilled lands 122,102 acres, area planted in cotton 32,103 acres, in tobacco 198 acres, in corn 44,469 acres, in wheat 7,041 acres, in rye 819 acres, in oats 1,779 acres. Cotton production 14,558 bales, average cotton product per acre 0.45 bale, 645 pounds seed-cotton, or 215 pounds cotton lint. Real property, aggregate value \$2,805,805, personal property \$1,678,279, total \$4,484,084. State taxes \$2,955.69, county taxes \$11,879.26, school taxes \$12,167.20. Live stock—Horses 2,280, mules 1,720, cattle 6,542, hogs 30,122, sheep 2,420. Public schools 80, white 42, colored 38. Churches 56.

LENOIR.

Lenoir county lies on the lower course of the Neuse, east of Wayne. The northern half consists of level pine uplands of the same character as those of the counties adjoining it on the north, having narrow tracts of swamp land along its water-courses, while in its western and northern parts there are wide tracts of level semi-swamp lands, which are characterized by a dark, fine gray loam of great fertility. The southern half of the county, south of the Neuse, is characterized generally by a more sandy soil, and on the higher divides between the streams by narrow zones of pine barrens. The water-courses in this half of the county are also bordered by cypress and gum swamps, and to some extent by oak and pine flats. Shell marl (blue), chalk marl, and green sand are all found in this county, one or the other in almost every neighborhood. Of the county area 28.72 per cent. is tilled land, of which 22.82 per cent. is cultivated in cotton. Means of transportation are furnished by steamboat and railroad to Newbern, Wilmington and Norfolk.

Population 15,344—White 7,277, colored 8,067. Area 457 square miles, woodland 122,571 acres. Tilled lands 83,943 acres, area planted in cotton 19,150 acres, in corn 29,838 acres, in wheat 5,067 acres, in rye 685 acres, in oats 1,060 acres. Cotton production 8,235 bales, average cotton product per acre 0.43 bale, 612 pounds seed-cotton, or 204 pounds cotton lint. Real property, aggregate value \$1,551,067, personal property \$836,919, total \$2,387,986. State taxes \$1,530.76, county taxes \$12,745.38, school taxes \$6,987.32. Live stock—Horses 311, mules 1,023, cattle 3,189, hogs 17,101, sheep 1,771. Public schools 65, white 36, colored 29. Churches 21.

DUPLIN.

Duplin county lies southward of the two preceding counties, and partakes of their general topographical and agricultural features. It is drained by Northeast Cape Fear river, which flows southward through its middle section, and both this and the numerous tributaries are bordered by belts of alluvial and often swampy lands. Near its northern and eastern borders are two small pocosons, and within its southern section lies one-half of the great Angola Bay pocoson, an almost impenetrable jungle of the average character of pocoson lands, with fringes of rich swamp lands on the streams that issue from it. This pocoson is flanked on the westward toward the Northeast Cape Fear river by a fringe of fertile white-oak flats and semi-swamp lands. Between the tributaries of the river, on the divides, are several tracts of sandy pine hills, which are very unproductive. The cotton lands, which are of limited extent, are the level piny woods of the usual description; but corn is a more valuable crop, and the product of potatoes and rice is of considerable importance. The county has still valuable resources in timber and turpentine lands. Marl (blue and white) is abundant, though but little used. Of the county area, 13.02 per cent. is tilled land, of which 13.93 per cent. is in cotton.

Population 18,773—White 10,587, colored 8,186. Area 832 square miles, woodland 288,505 acres. Tilled lands 69,314 acres, area planted in cotton 9,654 acres, in corn 33,813 acres, in wheat 1,031 acres, in rye 422 acres, in oats 433 acres. Cotton production 4,499 bales, average cotton product per acre 0.47 bale, 663 pounds seed-cotton or 221 pounds cotton lint. Real property, aggregate value \$964,428, personal property \$645,106, total \$1,609,534. State taxes \$1,057.00, county taxes \$5,932.73, school taxes \$5,824.10. Live stock—Horses 1,781, mules 644, cattle 9,664, hogs 30,179, sheep 7,371. Public schools 68, white 37, colored 31. Churches 32.

SAMPSON.

Sampson county lies in the middle of the long leaf pine belt, and much the larger part of its territory represents the average character of the soils and forests of that belt. It is drained by South river, one of the principal tributaries of the Cape Fear, whose streams divide its territory into north and

south lying belts or zones—flattish swells, the higher portions of which are characterized by sandy soils and forests predominantly of long-leaf pine. In places near the southern and western margins, and again near the northern end, there are tracts which are quite sandy and approach the character of pine barrens. There are also extensive pine flats, especially on the waters of Six Runs, with here and there considerable bodies of pine and oak flats.

The corn crop of the county is much more important than that of cotton, reaching nearly 500,000 bushels, and the crops of potatoes and rice are both unusually large. There are also large bodies of virgin pine timber, still valuable both for turpentine and for lumber. Marl is abundant, and is used with the best results in some sections, chiefly the northern. Of the county area, 18.95 per cent. is tilled land, of which 13.13 per cent. is cultivated in cotton.

Population 22,894—White 13,347, colored 9,547. Area 964 square miles, woodland 374,576 acres. Tilled lands 116,892 acres, area planted in cotton 15,346 acres, in tobacco 28 acres, in corn 53,951 acres, in wheat 1,249 acres, in rye 409 acres, in oats 654 acres. Cotton production 6,291 bales, average cotton product per acre 0.41 bale, 585 pounds seed-cotton, or 195 pounds cotton lint. Real property, aggregate value \$1,399,638, personal property \$835,769, total \$2,235,407. State taxes \$612.62, county taxes \$9,538.92, school taxes \$6,849.61. Live stock—horses 1,973, mules 1,270, cattle 10,239, hogs 37,802, sheep 8,934. Public schools 85, white 51, colored 34. Churches 26.

CUMBERLAND.

Through the middle of Cumberland county, from its western margin, on the Moore county line, to the Cape Fear river, which crosses the eastern side of the county, lies a broad, irregular zone of pine barrens with a very sandy and unproductive soil and an almost exclusive growth of long-leaf pine. On both sides of this zone, along the northern and southern sections of the county, with unimportant exceptions, and in the section eastward of the Cape Fear river, the soils belong to the class of gray sandy loams of the average upland pine woods. Near the river, on both sides, are large tracts of semi-swamp and oak and pine flats, which are very productive. Many of the streams which flow from the central pine barrens

of the county contain narrow fringes of gum and cypress swamp, and the swampy tracts along the river often contain a considerable percentage of cypress. The turpentine and lumber interests are still important. Of the county area 8.63 per cent. is tilled land, of which 16.98 per cent. is cultivated in cotton.

Population 23,836—White 12,594, colored 11,242. Area 982 square miles, woodland 294,178 acres. Tilled lands 54,238 acres, area planted in cotton 9,210 acres, in corn 32,677 acres, in wheat 1,141 acres, in rye 1,513 acres, in oats 1,509 acres. Cotton production 3,905 bales, average cotton product per acre 0.42 bale, 603 pounds seed-cotton, or 201 pounds cotton lint. Real property, aggregate value \$2,114,598, personal property \$1,068,386, total \$3,182,984. State taxes \$1,564.98, county taxes \$19,222.50, school taxes \$11,082.35. Live stock—Horses 1,482, mules 1,322, cattle 8,078, hogs 25,220, sheep 7,620. Public schools 89, white 54, colored 35. Churches 57.

HARNETT.

Harnett county lies on both sides of the Cape Fear river, on the northwestern margin of the long-leaf pine belt. Near the river, and for several miles on both sides, its surface is quite hilly in its upper portion, and here the soil is of the intermediate character described as oak and pine sandy and gravelly hills. On the tops of the ridges and river hills these soils are gray sandy loams; but on the slopes they approach the character of clay loams, and are covered mainly with forests of oak and short-leaf pine. The body of the county belongs strictly to the long-leaf pine belt, and has the general characteristics of that region. The western section, as well as a narrow belt in the middle, near the south bank of the river and some portions of the south side, partakes in part of the character of the pine barrens. Near the river, and along its principal tributaries from the west, and in the angles between these and the river, are wide tracts of gray, clayey, silty lands (oak and pine flats) and occasional narrow strips of gum and cypress swamp. Cotton production is the principal industry of the county, but grain, lumber and turpentine are also important products. Of the county area, 10.96 per cent. is tilled land, of which 22.01 per cent. is cultivated in cotton.

Population 10,862—White 7,092, colored 3,770. Area 601 square miles, woodland 175,096 acres. Tilled lands 42,173

acres, area planted in cotton 9,281 acres, in tobacco 32 acres, in corn 21,244 acres, in wheat 2,393 acres, in rye 489 acres, in oats 1,202 acres. Cotton production 3,627 bales, average cotton product per acre 0.39 bale, 558 pounds seed cotton or 186 pounds cotton lint. Real property, aggregate value, \$698,821, personal property \$328,979, total \$1,027,800. State taxes \$267.10, county taxes \$4,589.18, school taxes \$3,096.56. Live stock—Horses 746, mules 751, cattle 5,696, hogs 13,773, sheep 5,953. Churches 22.

MOORE.

Moore county lies on the western margin of the long-leaf pine belt. Its middle and southern portion belongs largely to the class of lands called pine barrens or "sand hills." The northern part of this triangular territory partakes more of the character of the oak uplands agricultural division, being very hilly and broken, with sandy and gravelly soil on the higher ridges, having a mixed oak and pine growth, and on the slopes of the hills partaking of the character of clay loams.

Near the middle (a little north of east), as well as in the southwestern region, and in the eastern one, are considerable bodies of level and rolling upland piny woods. These are the best cotton soils. The tributaries of the Cape Fear, which rise along the southeastern section of the county, are fringed with gum, cypress and juniper swamps, and on many of the streams, large and small, are patches, and sometimes considerable tracts, of alluvial "bottom" lands. The agriculture of the county is divided between cotton and grain crops; but the lumber and turpentine interests are quite important, and there are yet large turpentine forests untouched.

Of the county area, 13.32 per cent. is tilled land, of which 12.91 per cent. is cultivated in cotton.

Population 16,821—White 11,485, colored 5,336. Area 807 square miles, woodland 281,934 acres. Tilled lands 68,780 acres, area planted in cotton 8,882 acres, in tobacco 70 acres, in corn 27,934 acres, in wheat 11,242 acres, in rye 1,512 acres, in oats 7,924 acres. Cotton production 3,988 bales, average cotton product per acre 0.45 bale, 639 pounds seed-cotton, or 213 pounds cotton lint. Real property, aggregate value \$1,339,793, personal property \$825,975, total \$2,165,768. State taxes \$884.58, school taxes 5,667.03. Live stock—Horses 1,850, mules 1,414, cattle 9,739, hogs 16,587, sheep 12,010. Public schools 95, white 60, colored 35.

RICHMOND.

Richmond county also lies on the border of the long-leaf pine belt, its eastern and southern portions, forming not less than three-fourths of its territory, belonging to the latter, while its western and northern parts, lying along and near the Great Pee Dee river, belong more properly in their agricultural features to the zone of oak and pine sandy hills, being quite hilly, and in some places rugged. The slopes of the hills on the river front and its tributaries are quite steep and broken, and have a clay loam soil, which is covered by oak and short-leaf pine forests. In the northwestern corner, on the Pee Dee and its tributaries, are wide tracts of level gray loam soils, originally covered with heavy oak forests. Through the eastern portion of the county, in a north and south direction, lies a considerable tract of pine barrens, which is very sandy and unproductive. The streams which drain the southeastern section of the county (one-third of its territory) flow into Lumber river, and are margined through their whole course by alluvial tracts and cypress swamps, the divides between these parallel and south-flowing streams being occupied by level upland piny-woods tracts having a gray sandy loam soil of fair productiveness. Cotton is the chief single interest, but the product of grain is large, and the turpentine and lumber interests are still important. Of the county area, 14.24 per cent. is tilled land, of which 33.48 per cent. is cultivated in cotton.

Population 18,245—White 8,141, colored 10,104. Area 826 square miles, woodland 216,096 acres. Tilled lands 75,268 acres, area planted in cotton 25,198 acres, in corn 29,502 acres, in wheat 3,751 acres, in rye 942 acres, in oats 3,571 acres. Cotton production 12,754 bales, average cotton product per acre, 0.51 bale, 720 pounds seed-cotton, or 240 pounds cotton lint. Real property, aggregate value \$1,345,743, personal property \$970,717, total \$2,416,460. State taxes \$1,329.37, county taxes \$11,032.29, school taxes \$6,319.59. Live stock—Horses 1,246, mules 1,502, cattle 5,946, hogs 12,067, sheep 2,657. Public schools 72, white 43, colored 29. Churches 32.

ROBESON.

The soils of Robeson county are mainly those of the ordinary level piny woods, but there are belts of gum and cypress swamp along nearly all of its water-courses, those on the two

main streams being quite large. The county is drained by the upper waters of Lumber river, which enters the Atlantic through the State of South Carolina at Georgetown. On the higher divides between the streams the soil is sometimes quite sandy, in some places reaching the character of pine barrens. The lands are chiefly devoted to the culture of cotton and corn, but the value of the potato and rice crops is quite considerable. Turpentine and lumber are also large interests. Marl is found abundantly in the lower half of the county. Of the county area, 15.50 per cent. is tilled land, of which 20.96 per cent. is cultivated in cotton. Shipments are made by rail to Wilmington.

Population 23,880—White 11,942, colored 11,938. Area 1,039 square miles, woodland 383,093 acres. Tilled lands 103,055 acres, area planted in cotton 21,607 acres, in corn 49,961 acres, in wheat 875 acres, in rye 1,548 acres, in oats 2,814 acres. Cotton production 8,846 bales, average cotton product per acre, 0.41 bale, 582 pounds seed-cotton, or 194 pounds cotton lint. Real property, aggregate value \$2,451,255, personal property \$1,078,311, total \$3,529,566. State taxes \$947.63, county taxes \$11,897.37, school taxes \$9,577.74. Live stock—Horses 1,834, mules 2,058, cattle 9,952, hogs 32,082, sheep 8,475. Public schools 122, white 67, colored 55. Churches 53.

BLADEN.

Bladen county lies south of Cumberland, and, like it, on both sides of the Cape Fear river. It has narrow zones of pine barrens running parallel to the river courses nearly the whole length of the county, and it also abounds in cypress swamps and alluvial "bottoms" along its streams. There are also large bodies of level piny woods. Marl is found in the bluffs of the river. On many of the streams are extensive bodies of gum and cypress swamps. This county has a very limited agriculture, the chief crop being corn; and very little cotton is produced, turpentine and lumber being still among the chief interests. Of the county area, only 5.79 per cent. is tilled land, of which 4.26 per cent. is cultivated in cotton.

Population 16,158—White 7,598, colored 8,560. Area 1,026 square miles, woodland 297,237 acres. Tilled lands 37,990 acres, area planted in cotton 1,618 acres, in corn 21,556 acres, in wheat 109 acres, in oats 362 acres. Cotton production 683

bales, average cotton product per acre, 0.42 bale, 603 pounds seed-cotton, or 201 pounds cotton lint. Real property, aggregate value \$1,052,601, personal property \$665,905, total \$1,718,506. State taxes \$388.38, county taxes \$5,235.37, school taxes \$2,995.13. Live stock—Horses 718, mules 679, cattle 8,937, hogs 21,368, sheep 5,686. Public schools 58, white 26, colored 32. Churches 26.

OAK UPLANDS, OR METAMORPHIC REGION.

(This region embraces the following counties and parts of counties: Warren, Franklin, Vance, Granville, Wake, Durham, Orange, Chatham, Montgomery, Anson, Union, Stanly, Davidson, Rowan, Cabarrus, Mecklenburg, Iredell, Catawba, Lincoln, Gaston, Cleveland, Rutherford, Randolph, Guilford, Alamance, Person, Caswell, Rockingham, Stokes, Forsyth, Davie, Yadkin, Surry, Wilkes, Alexander, Caldwell, Burke, McDowell, and Polk).

WARREN.

Warren county lies on the northern border of the State, and is bounded in part by the Roanoke river, the tributaries of which drain about one-half of its territory, the southern half being drained by the Tar river. Through the middle of the county, along the divide between these rivers, lies a wide, level, and undulating tract, with forests of oak and short-leaf pine, hickory, dogwood, etc., having generally a soil of the class of gray and yellowish gravelly and sandy loam, and frequently belts of red clay loam. Northward and southward the land becomes more hilly, and near the streams the soil is more clayey and often reddish in color. Many of these streams are bordered by narrow strips of level bottom land. The tributaries of the Tar on the southern side are separated by wide tracts of nearly level oak uplands, and are bordered by extensive bottoms. This portion of the county is also less broken than the northern. The agriculture of the county is divided between the production of cotton, tobacco, and the cereals;

but the vine and the peach flourish, especially in the northern and western sections lying within the hill country. The western border of the county rises to an elevation of 500 feet, so that there is abundant water-power developed by the fall of its numerous streams, many of which leave its territory at an elevation of less than 200 feet. Gold mining has been a profitable industry in the southern corner of the county and the neighboring parts of Halifax, Nash, and Franklin.

Of the county area, 25.84 per cent. is tilled land, of which 25.76 per cent. is cultivated in cotton. Transportation to market is furnished by railroad to Raleigh, Norfolk, and New York.

Population 22,619—White 6,386, colored 16,233. Area 507 square miles, woodland 140,528 acres. Tilled lands 83,864 acres, area planted in cotton 21,603 acres, in tobacco 1,759 acres, in corn 28,457 acres, in wheat 5,098 acres, in oats 5,559 acres. Cotton production 7,778 bales, average cotton product per acre 0.36 bale, 513 pounds seed-cotton, or 171 pounds cotton lint. Real property, aggregate value \$1,198,012, personal property \$585,277, total \$1,783,289. State taxes \$574.06, county taxes \$11,459.33, school taxes \$4,301.35. Live stock—Horses 1,561, mules 422, cattle 7,736, hogs 12,104, sheep 3,019. Public schools 62, white 30, colored 32. Churches 23.

FRANKLIN

Franklin county lies south of Warren, and corresponds very nearly in all its agricultural and topographical features with the description of that county. The eastern, and especially the southeastern sections contain a considerable proportion of long-leaf pine as a constituent of the forests. This county is drained by Tar river and its tributaries. The middle portion belongs to the region of oak and pine gravelly and sandy hills, and the western end rises into the oak uplands. The large cotton product of this county is of recent date, but here and in the adjoining counties it has greatly increased in the last dozen years. The western half is largely devoted to the culture of tobacco. Of the county area, 25.99 per cent. is tilled land, of which 34.60 per cent. is cultivated in cotton.

Population 20,829—White 9,476, colored 11,353. Area 526 square miles, woodland 146,604 acres. Tilled lands 87,492 acres, area planted in cotton 30,274 acres, in tobacco 118 acres, in corn 32,642 acres, in wheat 8,362 acres, in oats 5,560 acres.

Cotton production 12,938 bales, average cotton product per acre 0.43 bale, 609 pounds seed-cotton, or 203 pounds cotton lint. Real property, aggregate value \$1,803,778, personal property \$739,724, total \$2,543,502. State taxes \$757.24, county taxes \$14,854.06, school taxes \$6,995.26 Live stock—Horses 1,695, mules 954, cattle 7,896, hogs 16,114, sheep 5,641. Public schools 91, white 37, colored 54. Churches 43.

GRANVILLE.

Granville county lies on the Virginia border west of the two preceding counties, and is drained partly toward the north by the tributaries of the Roanoke and partly (in its middle region) by the Tar and in its southern portions by the Neuse. In its central and higher portions, where it is 500 feet above tide, it is comparatively level and rolling, and has for the most part, a gray gravelly loam soil, with here and there small tracts of red clay. Among the most productive soils is a level body of oak and hickory land in the northern section with a dark gravelly-loam soil. Smaller tracts of similar character occur near the middle, and also on the southern border. The southern portion of the county, along the divide between the waters of the Tar and Neuse rivers, is another comparatively level bench of land, belonging mainly to the class of gray sandy loams, derived in large part from the underlying Triassic rocks (red-sandstone). These alternate with gray-gravelly loams. The forests are of oaks, hickory, and dogwood, intermingled with short-leaf pine. The principal agricultural product of this county is the gold-leaf tobacco, which is the largest crop in the State—more than 4,500,000 pounds.

The gray and light-colored granite soils of the eastern, middle and western sections, as well as the last-named (Triassic) soils, are noted for the high grade of tobacco which they produce. This is also a large grain-growing county, its aggregate reaching nearly 750,000 bushels. Of the county area 32.61 per cent. is under tillage, of which 4.52 per cent. is cultivated in cotton.

Population 31,286—White 13,603, colored 17,683. Area 695 square miles, woodland 161,089 acres. Tilled lands 145,036 acres, area planted in cotton 6,559 acres, in tobacco 8,941 acres, in corn 42,608 acres, in wheat 14,428 acres, in oats 14,344 acres. Cotton production 2,535 bales, average cotton product per acre 0.39 bale, 552 pounds seed-cotton, or 184 pounds cotton

lint. Real property, aggregate value \$1,864,196, personal property \$1,310,926, total \$3,175,122. State taxes \$1,179.10, county taxes \$17,117.03, school taxes \$7,682.40. Live stock—Horses 2,767, mules 923, cattle 8,359, hogs 16,470, sheep 7,831. Public schools 61, white 28, colored 33. Churches 42.

VANCE.

For description of this county see Granville.

Real property, aggregate value \$1,124,169, personal property \$750,727, total \$1,874,896. State taxes \$1,812.19, county taxes \$13,339.23, school taxes \$5,154.12. Live stock—Horses 1,414, mules 370, cattle 4,460, hogs 8,496, sheep 2,235. Public schools 43, white 18, colored 25. Churches 15.

WAKE.

Wake county in which the capital of the State is situated, is one of the largest counties in the State, and shows the largest product of cotton. It is drained by the tributaries of the Neuse, and lies on the eastern margin of the oak uplands, its southern and eastern sections partaking of the agricultural features of the oak and pine gravelly hills, the forests being made up of long-leaf and short-leaf pines, oaks, hickories, dogwoods, etc. The northern portion of the county, as well as the western, is quite hilly and broken in surface, especially along the streams, and the soils are predominantly gray and yellow sandy and gravelly loams, with occasional areas of red-clay soils. Cotton is the chief crop of the county, but the northwestern section adds to this industry the production of tobacco. The culture of corn is also a large feature in its agriculture, and in this crop Wake also stands first, exceeding 600,000 bushels, which, with the small grains added, would nearly reach 800,000 bushels. In elevation and surface features Wake resembles the counties last described, the levels ranging between 300 and 500 feet above the sea.

The product of cotton has greatly increased in this county (more than fourfold), as well as throughout this region and the State, in the last decade, and the fact is mainly due here, as elsewhere, to the increased consumption of commercial fertilizers. Of the county area 26.30 per cent. is tilled land, of which 38.19 per cent. is cultivated in cotton.

Population 47,939—White 24,289, colored 23,650. Area 932 square miles, woodland 240,004 acres. Tilled lands 156,899 acres, area planted in cotton 59,916 acres, in tobacco 230 acres, in corn 53,172 acres, in wheat 14,783 acres, in rye 211 acres, in oats 13,948 acres. Cotton production 30,115 bales, average cotton product per acre 0.50 bale, 717 pounds seed cotton, or 239 pounds cotton lint. Real property, aggregate value \$6,127,145, personal property \$4,482,044, total \$10,609,189. State taxes \$5,312.38, county taxes \$39,717.10, school taxes \$29,961.29. Live stock—Horses 2,711, mules 2,963, cattle 11,633, hogs 31,153, sheep 7,329. Public schools 166, white 87, colored 79. Churches 75.

ORANGE.

Cotton is beginning to enter largely into the agricultural interests of Orange county, and the product now is five times as large as it was in 1870. The upper half of this county is devoted, in large part, to the culture of tobacco, and the whole of it to the production of grain crops, of which the aggregate exceeds 550,000 bushels. It is traversed in a northeast and southwest direction through its middle region by chains of slate hills. Its levels lie between 400 and 800 feet above sea-level, the average elevation being about that of the State, viz, 640 feet. Its southeastern section is drained by the tributaries of the Cape Fear river, and has a low, undulating tract of land, with gray and yellow sandy and clay loam soils and mixed oak and pine forests. The larger part of this county is characterized by oak forests and red clay soils, with an intermixture in the poorer sections and on the slaty hills of short-leaf pine. The region described as slate hills is characterized mainly by a gray gravelly loam soil. Of the county area, 19.81 per cent. is under tillage, of which 6.40 per cent. is devoted to cotton. The University is located in this county.

Population 23,698—White 14,555, colored 9,143. Area 652 square miles, woodland 130,549 acres. Tilled lands 82,667 acres, area planted in cotton 5,290 acres, in tobacco 2,323 acres, in corn 28,542 acres, in wheat 18,358 acres, in oats 12,243 acres. Cotton production 1,919 bales, average cotton product per acre 0.36 bale, 516 pounds seed-cotton, or 172 pounds cotton lint. Real property, aggregate value \$1,249,375, personal property, \$745,682, total \$1,995,057. State taxes 401.95, county taxes \$9,044.02, school taxes \$4,637.90. Live stock—Horses 1,818, mules 676, cattle 5,896, hogs 12,094, sheep 7,018. Public schools 55, white 21, colored 34. Churches 31.

DURHAM.

For description of this county, see Orange.

Real property, aggregate value \$1,809,840, personal property \$2,203,209, total \$4,013,049. State taxes \$1,770.23, county taxes \$11,160.99, school taxes \$8,708.78. Live stock—Horses 1,327, mules 741, cattle 4,741, hogs 8,592, sheep 2,904. Public schools 58, white 33, colored 25. Churches 29.

CHATHAM.

Chatham county lies contiguous to the long-leaf pine belt, and includes a small strip of it along the southern edge. It is drained by the waters of the Cape Fear river, the main affluents of which unite near its southeast corner. The principal of these, Deep river, has on both sides extensive bottom lands, covered with oak and short-leaf pine forests, which are very productive. A large part of its surface is hilly and broken, especially near the rivers, and in the middle and northeastern sections these hills rise to an elevation of from 660 to 700 feet above the sea, attaining, in a few cases, the elevation and designation of small mountains; the average elevation is 500 feet. The soils are for the most part those of the oak uplands, generally sandy, gray to yellowish loams, alternating here and there with belts of red-clay soil. Toward the southern borders occur the sandy and gravelly oak and pine hills. With the exceptions noted, the forests consist mostly of oak, hickory, etc. Along the eastern margin of the county is a wide, level tract of oak and pine lands, with a gray clay loam soil of Triassic origin. Only a minor portion of Chatham, in the southern and eastern parts, is devoted to the culture of cotton, grain crops constituting its predominant agricultural interest. Its corn product exceeds 550,000 bushels, and the total grain crop exceeds 800,000 bushels. Its facilities for manufacturing are unsurpassed. Two large and two other considerable rivers cross its territory with a fall of from 300 to 400 feet, and develop a force of more than 40,000 horse-power. Of the county area, 22.55 per cent. is tilled land, of which 11.30 per cent. is cultivated in cotton.

Facilities for transportation are ample, both by railway and river.

Population 23,453—White 15,500, colored 7,953. Area 826 square miles, woodland 212,212 acres. Tilled lands 119,185

acres, area planted in cotton 13,478 acres, in tobacco 141 acres, in corn 43,087 acres, in wheat 28,930 acres, in oats 19,861 acres. Cotton production 5,858 bales, average cotton product per acre 0.43 bale, 618 pounds seed-cotton or 206 pounds cotton lint. Real property, aggregate value \$2,134,276, personal property \$1,083,930, total \$3,218,206. State taxes \$483.67, county taxes \$14,384.14, school taxes \$7,839.41. Live stock—Horses 2,951, mules 2,165, cattle 13,423, hogs 25,798, sheep 22,742. Public schools 122, white 71, colored 51. Churches 74.

MONTGOMERY.

In its topographical features Montgomery county may be described in nearly the same terms as Chatham. Several low chains of mountains or high ranges of slate hills cross its territory in a direction nearly north and south. The county is drained by the Yadkin river and two of its chief tributaries, the Uwharrie and Little rivers. Its territory, therefore, is quite broken in surface. Its soils are mostly sandy and gravelly loams, with occasional tracts of red clays. Along its eastern border, and particularly in its southeastern corner, there are large bodies of valuable timber, as it here touches the long-leaf pine belt; the lands are of the common character of this border region, and its soils are generally lean. Cotton is quite a subordinate interest in comparison with grains. Of the county area, 14.77 per cent. is tilled land, of which 14.11 per cent. is cultivated in cotton. The water-power of its rivers is very great, the Yadkin having a fall within the county of more than 200 feet and a force per foot of above 350 horse-power. There are many valuable gold mines, both vein and placer.

Population 9,374—White 6,857, colored 2,517. Area 489 square miles, woodland, 179,473 acres. Tilled lands 46,209 acres, area planted in cotton 6,519 acres, in tobacco 54 acres, in corn 18,090 acres, in wheat 9,197 acres, in oats 7,852 acres. Cotton production 2,989 bales, average cotton product per acre 0.46 bale, 654 pounds seed-cotton, or 218 pounds cotton lint. Real property, aggregate value \$700,683, personal property \$422,897, total \$1,123,580. State taxes \$214.11, county taxes \$9,508.07, school taxes \$2,969.85. Live stock—Horses 972, mules 762, cattle 4,658, hogs 11,991, sheep 6,113. Public schools 53, white 34, colored 19. Churches 29.

ANSON.

Anson county lies on the southern border of the State, and is bounded on the east by the Pee Dee river. About one-third of its territory, in the southeastern portion, belongs to the long-leaf pine belt, with its characteristic soils and forests. The northwestern and northern sections of the county consist of slate soils (gray, gravelly clays), occupied by forests of oak, short-leaf pine, hickory, dogwood, etc. The river hills near the Pee Dee have a sandy and gravelly loam, becoming more red and clayey on the lower slopes. There lies across the middle, in a northeast and southwest direction, a low, nearly level tract, 5 or 6 miles wide, of brown yellow, and gray sandy and clay loam soils, derived from the clays and sandstones of the Trias. These lands are naturally quite productive, but are much worn, and have been devoted mainly to the culture of cotton, which is the most important industry of the county, although the corn crops are quite large. Of the county area 25.31 per cent. is under tillage, of which 32.05 per cent. is in cotton.

Population 17,994—White 8,790, colored 9,204. Area 545 square miles, woodland 149,000 acres. Tilled lands 88,293 acres, area planted in cotton 28,296 acres, in corn 29,121 acres, in wheat 5,969 acres, in oats 8,999 acres. Cotton production 11,857 bales, average cotton product per acre 0.42 bale, 597 pounds seed-cotton, or 199 pounds cotton lint. Real property, aggregate value \$1,333,706, personal property \$691,833, total \$2,025,539, State taxes \$755.33, county taxes \$15,697.06, school taxes \$5,327.11. Live stock—Horses 1,106, mules 1,621, cattle 4,295, hogs 7,853, sheep 2,360. Public schools 61, white 22, colored 39. Churches 34.

UNION.

The southern portion of Union county, which lies on the South Carolina border, is penetrated to a distance of several miles by sinuses of long-leaf pine (sandy lands) on the level-backed divides between the streams. This portion of the county is drained southward into the Pee Dee through South Carolina.

The soils of a larger part of the county are of a slaty origin, and are gray gravelly and sandy for the most part, with occasional areas of red clays. The forests are mixed pine and oak, hickory, etc. The soils of a narrow belt along the west side

are granitic. The cotton product belongs mainly to the southern half, the northern portion being devoted to small grains, of which it produces large crops—a total of nearly 500,000 bushels. Of the county area 23.54 per cent. is tilled land, of which 22.75 per cent. is cultivated in cotton.

Population 18,056—White 13,520, colored 4,536. Area 557 square miles, woodland 176,245 acres. Tilled lands 83,913 acres, area planted in cotton 19,090 acres, in corn 28,877 acres, in wheat 12,464 acres, in oats 14,357 acres. Cotton production 8,336 bales, average cotton product per acre 0.44 bale, 621 pounds seed-cotton, or 207 pounds cotton lint. Real property, aggregate value \$1,868,867, personal property \$1,208,017, total \$3,016,884. State taxes \$939.04, county taxes \$10,763.22, school taxes \$7,682.37. Live stock—Horses 1,772, mules 2,034, cattle 8,038, hogs 20,848, sheep 10,315. Public schools 102, white 73, colored 29. Churches 26.

STANLY.

Stanly county lies on the west side of the Yadkin river, and is bounded on the south by the Rocky river, one of its largest tributaries. Its soils are derived from the clay and chlorite slates of the great central slate belt of the State, and are gray and gravelly loams or red clays, according as the underlying rock is of the former or of the latter description. The forests are of oak and short-leaf pine. Its surface is quite broken near the rivers. The southwestern corner of the county is characterized by broad and comparatively level tracts of gravelly land, covered with extensive short-leaf pine forests, with a subordinate growth of oaks. The cotton product is of about equal value with that of the grains, of which the total exceeds 400,000 bushels. The slate lands of this region produce heavier wheat than any other soils, reaching 65 and even 70 pounds to the bushel. Of the county area 21.21 per cent. is tilled land, of which 10.02 per cent is cultivated in cotton.

Transportation is by wagon to railroads of the adjacent counties.

Population 10,505—white 9,166, colored 1,339. Area 432 square miles, woodland 119,148 acres. Tilled lands 58,628 acres, area planted in cotton 5,878 acres, in corn 22,426 acres, in wheat 16,465 acres, in oats 10,975 acres. Cotton production 2,475 bales, average cotton product per acre 0.42 bale, 600 pounds seed-cotton, or 200 pounds cotton lint. Real property,

aggregate value \$1,116,123, personal property \$715,430, total \$1,831,553. State taxes \$163.62, county taxes \$12,932.67, school taxes \$3,984.78. Live Stock—Horses 1,641, mules 1,033, cattle 6,463, hogs 12,165, sheep 7,725. Public schools 63, white 54, colored 9. Churches 27.

DAVIDSON.

This county lies midway of the breadth of the State and of the midland division, and on the northern border of the cotton belt. The average elevation is about 800 feet above sea-level—the northern end 1,000 and the southwestern 600 feet, but is interrupted by ranges of hills which are 900 feet in height and upward. The county is bounded on the west by the tortuous course of the Yadkin river, whose numerous tributaries drain almost its entire surface, one of which, Abbott's creek, traverses its middle section from north to south, while a multitude of smaller streams flow in a generally southwest course into the river. Both the river itself and these tributaries are generally bordered by tracts of bottom lands with a rich alluvial soil, covered by heavy forests of oak—largely white oak. There are considerable tracts of red-clay soil scattered through various portions of the county, which are covered with heavy oak forests. The eastern and northern margins, which lie along the elevated divides and swells between the greater rivers, contain mixed oak and pine forests, and have a soil which is generally a gray and yellow gravelly or sandy loam. A clay subsoil is found throughout the county. The cotton product of Davidson county is small, and is limited to its southern end. Its wheat crop is the largest in the State, and its total grain product is only less than that of Rowan, amounting to 850,000 bushels. The southern half of the county lies within the great gold belt, and numerous mines of gold and quite a number of copper and silver have been opened. The slate hills of the south end are notable for their deposits of gold gravel, or placers. Of the county area, 31.39 per cent. is tilled land, of which only 3.33 per cent. is cultivated in cotton.

Transportation is by rail to Charleston, Norfolk and New York.

Population 20,333—White 16,341, colored 3,992. Area 564 square miles, woodland 142,673 acres. Tilled lands 113,314 acres, area planted in cotton 3,779 acres, in tobacco 484 acres, in corn 36,983 acres, in wheat 32,195 acres, in oats 16,924 acres.

Cotton production 1,553 bales, average cotton product per acre 0.41 bale, 585 pounds seed-cotton or 195 pounds cotton lint. Real property, aggregate value \$1,790,837, personal property \$1,036,511, total \$2,827,348. State taxes \$318.64, county taxes \$11,746.04, school taxes \$6,910.79. Live stock—Horses 6,918, mules 1,443, cattle 9,225, hogs 19,498, sheep 12,342. Public schools 97, white 72, colored 25. Churches 33.

ROWAN.

Rowan county lies on the west bank of the Yadkin river and south of its principal tributary, the South Yadkin, and resembles very closely in its agricultural and topographical features the county of Davidson, above described. Its entire surface is drained by the tributaries of the Yadkin, which traverse its territory in a northeasterly course. Its middle and northern sections, which lie for the most part above the level of 800 feet, rising at one point above 1,000 feet, are characterized by an abundance of red clay soils and heavy oak forests, interspersed with hickory, walnut, etc., only the higher parts of the watersheds between the streams showing any growth of pine (short-leaf), and having gray and yellow sandy loam soils. The southeastern corner of the county, amounting to one-third of its territory, is quite broken, and is traversed by low ranges of mountains or high hills, which rise in places to a level of a thousand feet and more above the sea. These consist geologically, for the most part, of ledges of granite. The hills of this region have a light gray and yellow sandy loam soil.

The culture of cotton has greatly increased in the past decade, but still occupies a secondary place in the agriculture of the county, most of its territory being better adapted to the growth of corn and small grains, of which the total is the largest in the State, being more than 875,000 bushels. The upper portion produces also a considerable quantity of tobacco. Of the county area, 30.59 per cent is tilled land, of which 12.34 per cent. is cultivated in cotton. There are many gold mines in this county, mostly in the southern part, and several copper veins.

Population 19,965—White 13,621, colored 6,344. Area 482 square miles, woodland 117,870 acres. Tilled lands 94,378 acres, area planted in cotton 10,645 acres, in tobacco 216 acres, in corn 38,963 acres, in wheat 24,195 acres, in rye 253 acres, in oats 17,751 acres. Cotton production 4,381 bales, average cot-

ton product per acre 0.41 bale, 585 pounds seed-cotton, or 195 pounds cotton lint. Real property, aggregate value \$2,468,474, personal property \$1,302,081, total \$3,770,555. State taxes \$847.49, county taxes \$7,674.05, school taxes \$10,845.35. Live stock—Horses 3,087, mules 1,502, cattle 7,593, hogs 16,230, sheep 5,875. Public schools 130, white 68, colored 62. Churches 49.

CABARRUS.

Cabarrus resembles Rowan county in its general features, both topographical and agricultural. It is drained by the upper waters of the Rocky river, one of the chief affluents of the Yadkin, and abounds in water-courses, which traverse its territory from northwest to southeast, dividing it into narrow zones or flattish swells, the higher parts of which are comparatively level and are covered with a growth of oaks and pines and have a characteristic gray to yellow loam soil, while along the borders of the streams there are numerous and often extensive tracts of alluvial bottom lands, which, as well as large tracts of red clay and dark gravelly loam soils, are covered with heavy forests of oak, hickory, walnut, poplar, maple, etc. Along the eastern margin of the county lies a narrow belt of a few miles in breadth of slate hill-land, in the forests of which the short-leaf pine predominates. The soils of this tract are much less productive than the average of the county. Cotton enters as a large element into the agriculture of this county, and divides almost equally the attention of its population with grain crops, of which it produces more than half a million bushels. Of the county area, 33.97 per cent. is tilled land, of which 23.90 per cent. is cultivated in cotton. Gold and copper mining also come in for a considerable share of attention.

Population 14,964—White 9,849, colored 5,115. Area 370 square miles, woodland 86,297 acres. Tilled lands 80,439 acres, area planted in cotton 19,224 acres, in corn 26,831 acres, in wheat 17,550 acres, in oats 7,592 acres. Cotton production 7,467 bales, average cotton product per acre 0.39 bale, 552 pounds seed-cotton, or 184 pounds cotton lint. Real property, aggregate value \$1,676,606, personal property \$1,047,398, total \$2,724,204. State taxes \$658.88, county taxes \$11,195.27, school taxes \$6,026.14. Live stock—Horses 2,235, mules 1,531, cattle 5,986, hogs 11,314, sheep 3,946. Public schools 107, white 64, colored 43. Churches 39.

MECKLENBURG.

Mecklenburg county lies on the southern border of the State, and is bounded westward by the Catawba river. The elevation varies between 600 and 900 feet, the average being about 700 above the sea. This is one of the largest and most productive as well as one of the most populous counties in the State. The production of cotton constitutes the principal feature of the agriculture of the entire county, having increased more than three-fold in the last ten years; before the war the culture of cotton did not reach northward beyond the middle of the county. A considerable portion of the territory of this county belongs to the class of red clay lands which were originally covered with heavy forests of oak, pine coming in as a constituent of the forests only on the summits of the ridges and divides between the streams, where the soils are gray and yellow, sandy loams. The higher portion of the county, which lies along the watershed between the Yadkin and the Catawba in a north and south direction, belongs, in the main, to the latter class of soils, but has here and there small tracts of red clay. Of the county area, 36.36 per cent. is under tillage, and of this 30.85 per cent. is in cotton. This county shows a large product of cotton, ranking third in this respect; and also produces corn and the small grains on a large scale, aggregating 800,000 bushels. Gold and copper mining are important industries in several sections of the county.

Charlotte being an important railroad centre, the county has ample facilities for shipment in every direction.

Population 34,175—White 17,922, colored 16,253. Area 576 square miles, woodland 115,649 acres. Tilled lands, 134,028 acres, area planted in cotton 41,343 acres, in corn 41,285 acres, in wheat 12,295 acres, in oats 12,949 acres. Cotton production 19,129 bales, average cotton product per acre 0.46 bale, 660 pounds seed-cotton or 220 pounds cotton lint. Real property, aggregate value \$4,700,698, personal property \$1,762,660, total \$6,463,358. State taxes \$4,066.25, county taxes \$41,702.80, school taxes \$16,223.42. Live stock—Horses 2,533, mules 3,160, cattle 7,326, hogs 2,210, sheep 4,821. Public schools 195, white 91, colored 104. Churches 53.

IREDELL.

Iredell is a county of rolling uplands, and lies on the waters of the Catawba on the west, and of the Yadkin on the east,

being mainly drained by the latter. It is divided in a north-westerly and southeasterly direction by the course of the tributary streams into broad, flattish, elevated zones, the summits of which have generally a gray and yellow loam soil, with mixed oak and pine forests and occasional tracts of red clay oak-covered soils, while along the streams, which abound in alluvial bottoms, forests of oak, walnut, hickory, etc., predominate. One of these high swells or divides lies along and quite close to the course of the Catawba river, and has an elevation of 900 feet in its southern portion, rising to 1,000 feet and upward at its northern limit. The average elevation of the county is but little below 1,000 feet above sea-level.

The cotton crop has increased tenfold since 1870, and is confined mainly to the southern half, this form of agriculture having only recently passed beyond the middle of the county. The northern section produces tobacco as its chief market crop, but corn and the small grains occupy the larger portion of the tilled surface of the county, and aggregate more than 800,000 bushels. Of the county area 26.53 per cent. is tilled land, of which 11.49 per cent. is cultivated in cotton. Transportation is by rail, east, west, and south.

Population 22,675—White 16,752, colored 5,923. Area 595 square miles, woodland 153,039 acres. Tilled lands 101,018 acres, area planted in cotton 11,603 acres, in tobacco 465 acres, in corn 39,264 acres, in wheat 17,476 acres, in rye 359 acres, in oats 17,488 acres. Cotton production 4,657 bales, average cotton product per acre 0.40 bale, 573 pounds seed-cotton, or 191 pounds cotton lint. Real property, aggregate value \$2,452,780, personal property \$1,361,416, total \$3,814,196. State taxes \$1,033.55, county taxes \$19,584.87, school taxes \$8,754.36. Live stock—Horses 2,711, mules 2,015, cattle 8,285, hogs 15,759, sheep 8,771. Public schools 171, white 95, colored 76. Churches 56.

CATAWBA.

Catawba county lies on the northern border of the cotton belt and on the margin of the Piedmont division of the State. It is bounded northward and eastward by the Catawba river, and has its western end on the foot-hills of the South mountains. As to its middle, southern, and eastern parts, it resembles the county of Iredell, from which it is separated by the Catawba river. Through the middle region of it, and in a

northeast and southwest direction, is a broad belt of oak and hickory forest with a red clay soil, while that of the western section is a light to yellow sandy loam. The streams of this county, all of which flow into the Catawba, are occasionally bordered by considerable tracts of alluvial lands, and along the course of the Catawba are extensive bottoms. These and the red lands of the county are very productive. In the southeastern corner, as well as along the northwestern border, are mountain spurs which rise to an elevation of 1,500 feet and more above sea-level. A broad, flattish plateau crosses the county in a northwest and southeast direction between these mountain spurs, which, for the most part, is characterized by sandy and gravelly loams, and its oak forests are intermingled with much pine.

The culture of cotton has been introduced into the county since 1870, and has become the money crop. The larger part of its territory is still devoted to grain, of which more than half a million bushels are produced. Tobacco has been added to the list of its products within a few years, nearly half of the county being well adapted to the better grades of this crop. Of the county area 26.46 per cent is tilled land, of which 7 per cent. is cultivated in cotton. Transportation is by railroad, east, west, and south.

Population 14,946—White 12,469, colored 2,477. Area 445 square miles, woodland 110,328 acres. Tilled lands 75,350 acres, area planted in cotton 5,175 acres, in tobacco 49 acres, in corn 21,248 acres, in wheat 15,054 acres, in oats 7,566 acres. Cotton production 2,012 bales, average cotton product per acre 0.39 bale, 555 pounds seed-cotton, or 185 pounds cotton lint. Real property, aggregate value \$1,604,699, personal property \$1,093,615, total \$2,698,314. State taxes \$638.25, county taxes \$7,481.52, school taxes \$5,919.26. Live stock—Horses 2,000, mules 1,401, cattle 7,779, hogs 13,263, sheep 6,888. Public schools 71, white 55, colored 16. Churches 33.

LINCOLN.

Lincoln county lies south of Catawba county and west of the Catawba river, and its features, agricultural and topographical, are those of that county, and may be described in nearly the same terms. Its territory is drained by the parallel courses of the numerous tributaries of the South Fork of the Catawba, which traverses its middle section, and the average elevation

is nearly 1,000 feet above sea-level. In its middle portion is a north and south zone, several miles in breadth, of red-clay soils, with oak and hickory forests. For the rest, its forests are mixed oak and pine, and its soils are gray and yellow gravelly loams. The eastern side of the county is quite hilly near the river.

Only within the last few years has the culture of cotton entered to any considerable extent into the agriculture of this county, and it already holds the leading rank. Of the county area, 28.37 per cent. is under tillage, and of this 13.89 per cent. is in cotton. The manufactures of the county, especially in iron and cotton, have always been considerable.

Railroads cross the county in two directions, furnishing ample means of transportation.

Population 11,061—White 8,180, colored 2,881. Area 295 square miles, woodland 20,293 acres. Tilled lands 53,571 acres, area planted in cotton 7,442 acres, in corn 19,338 acres, in wheat 10,159 acres, in oats 6,313 acres. Cotton production 2,945 bales, average cotton product per acre 0.40 bale, 564 pounds seed-cotton or 188 pounds cotton lint. Real property, aggregate value \$1,288,450, personal property \$719,376, total \$2,007,826. State taxes \$608.84, county taxes \$5,105.61, school taxes \$4,480.97. Live stock—Horses 1,188, mules 1,379, cattle 5,036, hogs 9,605, sheep 4,344. Public schools 44, white 35, colored 9. Churches 27.

GASTON.

Gaston, a small county, lies on the southern border of the State, and is bounded eastward by the Catawba river, whose tributaries drain its entire surface. In the southern section are several small mountain chains and spurs, the highest of which, King's mountain, reaches an altitude of nearly 1,700 feet above sea-level. Most of the county is quite broken, and partakes of the character of the Piedmont division. It is characterized by mixed forests of oak and pine and by gray and yellow gravelly soils of moderate fertility, with occasional areas of red-clay soils. In the northwestern section are the largest tracts of oak and hickory forests, with their corresponding red-clay soils.

Of the county area, 25.57 per cent. is under tillage, and of this 18.38 per cent. is in cotton. The product of cotton has increased sixfold in the last ten years.

There are many valuable beds of iron ore in the county, and the manufactures of cotton, and formerly of iron, have attained considerable importance. It is one of the oldest iron manufacturing regions of the south, some of its furnaces dating back nearly one hundred years. In water-power it has superior advantages. It has also several noted gold mines.

Population 14,254—White 10,188, colored 4,066. Area 364 square miles, woodland 97,543 acres. Tilled lands 59,569 acres, area planted in cotton 10,949 acres, in corn 24,678 acres, in wheat 11,566 acres, in oats 6,699 acres. Cotton production 4,588 bales, average cotton product per acre, 0.42 bale, 597 pounds seed-cotton or 199 pounds cotton lint. Real property, aggregate value \$1,795,486, personal property \$1,037,372, total \$2,832,858. State taxes \$467.58, county taxes \$12,762.34, school taxes \$6,139.23. Live stock—Horses 2,011, mules 1,743, cattle 5,098, hogs 10,255, sheep 4,905. Public schools 74, white 54, colored 20. Churches 32.

CLEVELAND.

Cleveland county is situated on the southern border of the State, and lies westward of Gaston county. Its northern end rests upon the summit of the South mountains, at an elevation of nearly 3,000 feet above sea-level, and its upper half belongs properly to the Piedmont division. It is drained by several large tributaries of the Broad river, which rise in this chain and cross the county southward into South Carolina. Its agricultural and topographical features are very similar to those of Catawba county, to which its territory is contiguous. Its soils consist of alternating tracts of red or reddish clay and gray and yellow gravelly loams (chiefly the latter), and have their corresponding forests of oak and of oak mingled with pine. This county produces cotton throughout its territory even up to the flanks and on the slopes of the South mountains, although this form of agriculture is the growth of a decade, the product having increased twelvefold in that time. The production of grain exceeds 500,000 bushels. Of the county area 28.88 per cent. is tilled land, of which cotton occupies 22.43 per cent. Gold mining is also a familiar industry, placers being common in the north and vein mines in the south end.

Population 16,571—White 13,700, colored 2,871. Area 464 square miles, woodland 129,115 acres. Tilled lands 85,752 acres, area planted in cotton 19,238 acres, in corn 31,339

acres, in wheat 11,116 acres, in oats 10,959 acres. Cotton production 6,126 bales, average cotton product per acre 0.32 bale, 453 pounds seed-cotton, or 151 pounds cotton lint. Real property, aggregate value \$2,353,268. personal property \$945,984, total \$3,299,252. State taxes \$599, county taxes \$15,255.33, school taxes \$5,078.44. Live stock—Horses 1,345, mules 2,050, cattle 7,006, hogs 9,878, sheep 5,936. Public schools 90, white 69, colored 21. Churches 43.

RUTHERFORD.

The topographical features of Rutherford county may be described in the same terms as those of Cleveland, which bounds it on the east. Like that, it is traversed from its northern limit, in the South mountains, by the parallel southerly courses of several large tributaries of the Broad river. Its northern half is, in many places, quite rugged and mountainous (being properly a part of the Piedmont division), and its northwestern corner rests on some of the summits of the Blue Ridge at an elevation of nearly 4,000 feet. Its soils and its agriculture correspond in all their features to those of Cleveland county, and its cotton product has increased seventeen fold since 1870. Gold mining is also an industry of some importance, especially in the northern section, where placers are abundant and extensive on the flanks of the South mountains and in the beds of the streams at their base. Of the county area, 19.18 per cent. is tilled land, of which 15.16 per cent. is planted in cotton.

Transportation is by wagon to the railroads of adjacent counties, and thence to Charlotte, Wilmington and Charleston.

Population 15,198—White 11,910, colored 3,288. Area 520 square miles, woodland 180,192 acres. Tilled lands 63,825 acres, area planted in cotton 9,679 acres, in tobacco 38 acres, in corn 32,783 acres, in wheat 8,683 acres, in rye 689 acres, in oats 6,166 acres. Cotton production 2,079 bales, average cotton product per acre 0.21 bale, 306 pounds seed-cotton or 102 pounds cotton lint. Real property, aggregate value \$1,118,401, personal property \$437,256, total \$1,555,657. State taxes \$218.07, county taxes \$19,158.10, school taxes \$4,264.98. Live stock—Horses 1,253, mules 1,486, cattle 7,080, hogs 10,651, sheep 5,714. Public schools 99, white 76, colored 23.

RANDOLPH.

The southern portion of Randolph county for a few miles from its border partakes in part of the character of the long-leaf pine belt, but for much the larger part of its territory it belongs strictly to the oak upland region, its surface being quite hilly and broken, and near the western margin there are several small mountains. Through its middle region, from northwest to southeast, is an elevated ridge or divide between the waters of the Deep river and the Yadkin which has an altitude of from 700 to 900 feet above the level of the sea. The western and southern sections of the county are characterized by the occurrence of sharp ridges and hills of slate, with light-gray, sandy, gravelly soil; but the upper portion is much less broken, and consists of broad, flattish swells, which constitute the divides between the upper waters of the Haw, Deep and Uwharrie rivers, the latter being one of the tributaries of the Yadkin. The soils of this portion of the county are, for the most part, gray, gravelly loams, alternated here and there with red clay lands. Cotton is produced in only a small part of the southern half of the county, the production of small grains (700,000 bushels) constituting its principal agricultural feature. Of the county area, 20.44 per cent. is tilled land, of which only 0.65 per cent. is planted in cotton. There are several noted gold mines in this county.

Transportation is furnished by the North Carolina railroad, which crosses the upper corner of the county.

Population 20,836—White 17,758, colored 3,078. Area 701 square miles, woodland 237,999 acres. Tilled lands 91,693 acres, area planted in cotton 595 acres, in tobacco 45 acres, in corn 35,338 acres, in wheat 29,443 acres, in oats 13,524 acres. Cotton production 295 bales, average cotton product per acre 0.50 bale, 708 pounds seed cotton, or 236 pounds cotton lint. Real property, aggregate value \$2,062,800, personal property \$1,080,650. total \$3,143,450. State taxes \$396.89, county taxes \$19,519.98, school taxes \$5,236.24. Live stock—Horses 3,183, mules 1,679, cattle 12,393, hogs 22,925, sheep 2,330. Public schools 124, white 104, colored 20. Churches 52.

GUILFORD.

Guilford county lies in the middle of the midland plateau, and near its highest part, on the water-shed between the Cape Fear and Dan rivers, which crosses its territory nearly mid-

way in a west and east direction at an average elevation of between 800 and 1,000 feet above tide. In its physical characteristics and its agricultural features this county may be taken as a typical average of this region. This elevated swell of land between the water-courses, with its projections at right angles between the main tributaries of the above mentioned rivers, is characterized by quite a uniform forest growth and soil, both of which may be taken as representative of these features for the major part of the midland division. Its forests consist mainly of oaks of various species and hickory, with a subordinate growth of short-leaf pine scattered quite uniformly over most of its area. Along its river and creek bottoms, which are in many parts of the county extensive, and in the southeastern section of the county—even on the uplands—are heavy forests of oak, intermingled with hickory, walnut, poplar, maple, etc. These lands have generally a reddish clay loam soil. The soil of the higher and broad-backed ridges and swells is quite uniformly a yellowish sandy and gravelly loam, underlaid by a yellow and red clay subsoil. The cotton zone barely touches the southern border, the chief crops of the county consisting of grains (of which the aggregate exceeds three-quarters of a million bushels) and tobacco, the product of which is nearly half a million pounds, grown mostly in the northern half of the county. Of the county area 28.10 per cent. is tilled land, of which only 0.22 per cent. is planted in cotton. Gold, copper, and iron are found in many places, and have been mined on a considerable scale chiefly before the war.

Transportation is east, west and north by rail to Richmond, Norfolk and New York.

Population 23,585—White 16,885, colored 6,700. Area 682 square miles, woodland 108,071 acres. Tilled lands 126,722 acres, area planted in cotton 283 acres, in tobacco 910 acres, in corn 39,790 acres, in wheat 27,743 acres, in rye 354 acres, in oats 20,774 acres. Cotton production 114 bales, average cotton product per acre 0.40 bale, 573 pounds seed-cotton, or 191 pounds cotton lint. Real property, aggregate value \$2,930,158, personal property \$1,654,690, total \$4,584,848. State taxes \$1,320.52, county taxes \$17,515.30, school taxes \$10,729.93. Live stock—Horses 3,464, mules 1,111, cattle 11,876, hogs 17,831, sheep 1,167. Public schools 124, white 89, colored 35. Churches 77.

ALAMANCE.

This county is drained by the upper waters of the Cape Fear river, and one of its principal tributaries, the Haw river, crosses it from the northwestern to the southeastern corner. The soils of this county are largely fertile red-clay loams, with oak and hickory forests. Slate hills, which rise to the elevation of low mountain chains, occupy the southern end of the county, and have oak and pine forests and thin, sandy loam soils. The northern portion consists of alternating tracts of gray sandy loams and red clays. The cotton belt barely touches the southern edge of the county. The upper end is devoted to the production of tobacco, and the whole of it to grain crops, of which the yield is large.

The manufacturing facilities of the county are very great, and, in number of cotton-looms and spindles, Alamance stands first of all the counties in the State. There are also gold deposits, both vein and placer, in the middle and southern sections.

Of the county area, 25.50 per cent. is tilled land, of which 0.29 per cent. is cultivated in cotton. Transportation is east and west by rail.

Population 14,613—White 9,997 colored 4,616. Area 445 square miles, woodland 71,239 acres. Tilled lands 72,621 acres, area planted in cotton 211 acres, in tobacco 1,688 acres, in corn 24,628 acres, in wheat 18 661 acres, in oats 9,618 acres. Cotton production 91 bales, average cotton product per acre 0.43 bale, 615 pounds seed cotton or 205 pounds cotton lint. Real property, aggregate value \$1,715,239, personal property, \$1,501,981, total \$3,217,220. State taxes \$547.39, county taxes \$15,656.59, school taxes \$7,952.88. Live stock—Horses 2,423, mules 688, cattle 6,301, hogs 12,522, sheep 6,527. Public schools 68, white 47, colored 21. Churches 37.

PERSON.

Person county lies outside of the cotton belt, and belongs to the bright tobacco zone. Near the middle of it rise several low mountain ridges of granite and slate, with oak and pine forests. These attain an altitude of about 1,000 feet (the general elevation being from 600 to 700 feet), and have a thin gravelly and sandy soil, while the other sections are alternately of this character and of red clay soils of greater fertility. To

the latter class belong especially the northwestern and southeastern sections. The chief agricultural interest is the production of tobacco of a high grade, in which industry this is one of the leading counties. To this crop the light sandy soils are peculiarly adapted. In tobacco product Person county is fourth in rank. Of the county area 27.91 per cent. is tilled land, of which only an insignificant portion is planted in cotton.

Transportation is by wagon to the railroad in adjoining counties, and so to Richmond and the other markets.

Population 13,719—White 7,206, colored 6,513. Area 401 square miles, woodland 96,011 acres. Tilled lands 71,634 acres, area planted in cotton 2 acres, in tobacco 5,868 acres, in corn 19,372 acres, in wheat 8,974 acres, in oats 9,821 acres. Cotton production 1 bale, average cotton product per acre 0.50 bale, 711 pounds seed-cotton, or 237 pounds cotton lint. Real property, aggregate value \$1,005,824, personal property \$813,628, total \$1,819,450. State taxes \$466.19, county taxes \$12,037.83, school taxes \$5,035.49. Live stock—Horses 1,874, mules 786, cattle 5,985, hogs 12,468, sheep 6,236. Public schools 41, white 19, colored 22. Churches 29.

CASWELL.

Caswell county duplicates the features of Person, both agriculturally and topographically, except that the mountains are wanting. The larger part of its territory is devoted to the production of bright yellow tobacco, while grain crops occupy a comparatively subordinate position, and are produced principally along the river and creek bottoms which abound in the northern and eastern sections of this county. The northeastern section consists largely of red clay lands, with oak and hickory forests, while the lighter tobacco soils occupy most of the southern and western portions. Caswell ranks third among the tobacco counties in aggregate product. Of the county area 32.07 per cent. is tilled land, of which 0.01 per cent. is planted in cotton.

Transportation is furnished by the Richmond and Danville railroad and a branch of it.

Population 17,825—White 7,169, colored 10,656. Area 407 square miles, woodland 76,200 acres. Tilled lands 83,545 acres, area planted in cotton 6 acres, in tobacco 10,174 acres, in corn 25,663 acres, in wheat 10,841 acres, in oats 14,441

acres. Cotton production 4 bales, average cotton product per acre 0.67 bale, 951 pounds seed-cotton, or 317 pounds cotton lint. Real property, aggregate value \$1,328,962, personal property \$1,000,582, total \$2,329,544. State taxes \$1,175.97, county taxes \$8,764.67, school taxes \$6,134.49. Live stock—Horses 1,756, mules 895, cattle 3,853, hogs 10,073, sheep 1,742. Public schools 65, white 31, colored 34. Churches 35.

ROCKINGHAM.

Rockingham, like the two preceding, is a border county, and belongs to the same famous bright tobacco belt. It is traversed in a northeasterly course by the waters of the Dan river, and its southern section is drained by the upper tributaries of the Cape Fear (Haw) river. The northwestern corner of this county, constituting about one-third of its territory, near the Virginia line and north of the Dan river, consists for the most part of elevated flattish ridges and swells having gray, yellow, gravelly loam soils, while the southern and eastern two-thirds of the county consist of alternating belts of these loams and of red clays. Besides tobacco, in which this county ranks second, large crops of grain are produced—upward of 600,000 bushels. Dan river, with its tributaries, furnishes abundant water power, and the former stream is navigable in a small way for flat boats. A bed of semi-bituminous coal, 3 feet in thickness, and of good quality, outcrops in the eastern section, but it has been but little mined. Of the county area 20.79 per cent. is tilled land, of which only 0.01 per cent. is planted in cotton.

Shipments are made by rail to Danville, Richmond, and other markets.

Population 21,744—White 12,431, colored 9,313. Area 582 square miles, woodland 138,200 acres. Tilled lands 77,439 acres, area planted in cotton 5 acres, in tobacco 9,332 acres, in corn 25,175 acres, in wheat 11,298 acres, in rye 301 acres, in oats 15,200 acres. Cotton production 3 bales, average cotton product per acre 0.60 bale, 855 pounds seed-cotton, or 285 pounds cotton lint. Real property, aggregate value \$1,903,114, personal property \$1,364,908, total \$3,268,022. State taxes \$1,538.09, county taxes \$24,299.70, school taxes \$8,273.77. Live stock—Horses 1,899, mules 1,057, cattle 6,387, hogs 13,047, sheep 4,724. Public schools 94, white 56, colored 38. Churches 25.

STOKES.

Stokes is another border county, and belongs also to the bright tobacco belt. It is drained by the upper tributaries of the Dan, and belongs to the Piedmont division of the State. Its surface is for the most part quite rugged and broken, containing the terminal spurs and ridges of the Brushy mountains, which here attain an elevation of more than 2,500 feet above the sea. The general elevation is above 1,000 feet. The forests of this county and of the Piedmont region generally contain an added element, the chestnut, on elevated ridges and mountain slopes, and the proportion increases with the elevation. A new species of oak also makes its appearance, the chestnut oak, which occupies the crests and upper slopes of the poorer stony and gravelly ridges of the whole mountain region. The proportion of sourwood (*Oxydendron*) also increases to such an extent in the Piedmont region as to become a marked characteristic of its forests, and is indicative of a scant soil. It is worthy of note that, with the extinction of the herbage which originally mantled the soil and kept it moist, the chestnut has almost disappeared in half a century from the upper midland counties, and is dying out slowly in the Piedmont region.

The soils of this county resemble those of Rockingham, being predominantly yellow and gray gravelly loams, with occasional red clay belts, the former well adapted to the production of the higher grades of tobacco, which constitutes the chief element of its agriculture, and in the total product of which this county stands fifth. Its manufacturing facilities are great but undeveloped, and it is rich in iron ores. Its agriculture has the advantage of the presence of several limestone beds, and there are also outcrops of semi-bituminous coal in the southeastern section. Of the county area 17.52 per cent. is tilled land, of which only 0.02 per cent. is planted in cotton.

Transportation is by wagon, and occasionally by flat boats on the Dan river. A railroad from Greensboro is nearly finished to the border.

Population 15,353—White 11,730, colored 3,623. Area 476 square miles, woodland 131,483 acres. Tilled lands 53,369 acres, area planted in cotton 13 acres, in tobacco 4,690 acres, in corn 19,969 acres, in wheat 9,374 acres, in rye 1,195 acres, in oats 8,408 acres. Cotton production 7 bales, average cotton product per acre 0.54 bale, 768 pounds seed-cotton, or 256

pounds cotton lint. Real property, aggregate value \$825,704, personal property \$453,588, total \$1,279,292. State taxes \$253.38, county taxes \$5,607.27, school taxes \$4,081.11. Live stock—Horses 1,240, mules 1,075, cattle 5,307, hogs 11,317, sheep 4,438. Public schools 75, white 56, colored 19. Churches 22.

FORSYTH.

Forsyth county lies west of Guilford, and is bounded on the west by the Yadkin river. Through its middle portion is a broad swell or plateau, the divide between the waters of the Yadkin and Dan, with an elevation of from 1,000 to 1,200 feet, and having forests of oak, dogwood, sourwood, pine, etc. Its soils are light, gray loams. The tributaries of the Yadkin, which drain the southwestern section, abound in bottom lands of great fertility, and have heavy oak forests interspersed with hickory, walnut, poplar, etc., while the middle, northern, and eastern sections are characterized largely by gray sandy loam soils with forests of oak and pine. This county shows an increasing product of the better and medium grades of tobacco, but it produces chiefly grain crops—an aggregate of more than 500,000 bushels. Of the county area 25.39 per cent. is tilled land, of which cotton occupies only 0.03 per cent.

Transportation is by rail to Greensboro and to the other markets beyond.

Population 18,070—White 13,441, colored 4,629. Area 364 square miles, woodland 91,053 acres. Tilled lands 59,157 acres, area planted in cotton 16 acres, in tobacco 1,693 acres, in corn 20,920 acres, in wheat 13,590 acres, in rye 492 acres, in oats 11,780 acres. Cotton production 10 bales, average cotton product per acre 0.63 bale, 891 pounds seed-cotton, or 297 pounds cotton lint. Real property, aggregate value \$2,136,413, personal property \$1,957,240, total \$4,193,653. State taxes \$2,907.63. Live stock—Horses 2,021, mules 714, cattle 4,997, hogs 10,519, sheep 3,606. Public schools 73, white 54, colored 19. Churches 44.

DAVIE.

The small county of Davie lies in the angle between the Yadkin and the South Yadkin rivers, and resembles in its general features the preceding county. It also corresponds with

that county in its agricultural productions. In the southern half of this county the soils belong largely to the class of red clays, and are covered with heavy oak forests, while the middle and northern portions have a mixed growth of oaks and pines and a light-gray, sandy and gravelly soil. This section of the county is mainly devoted to the culture of tobacco. The river hills, flanking both the Yadkin and its chief tributaries, are quite broken, and have a productive gravelly loam soil and forests predominantly of oak. The elevation of the surface ranges from 700 to 1,000 feet, the average being about 850 feet above sea-level. The culture of cotton has recently entered the southern and western townships. The grain crop is quite large, exceeding 650,000 bushels; and latterly, also, tobacco has been cultivated to a considerable extent in the north and west sections, the soils of a large part of its territory being well adapted to the higher grades. There are several valuable iron ore deposits in the county. Of the county area, only 32.05 per cent. is tilled land, and the proportion of cotton planted is 1.33 per cent. of the latter.

Transportation is furnished by the Western North Carolina railroad, which crosses the adjacent county of Rowan.

Population 11,096—White 7,770, colored 3,326. Area 289 square miles, woodland 63,566 acres. Tilled lands 59,272 acres, area planted in cotton 790 acres, in tobacco 1,205 acres, in corn 22,125 acres, in wheat 13,244 acres, in rye 444 acres, in oats 13,366 acres. Cotton production 302 bales, average cotton product per acre 0.38 bale, 546 pounds seed-cotton or 182 pounds cotton lint. Real property, aggregate value \$909,380, personal property \$565,153, total \$1,474,533. State taxes \$377.25, county taxes \$6,619.49, school taxes \$3,771.79. Live stock—Horses 1,618, mules 965, cattle 3,715, hogs 9,368, sheep 3,400. Public schools 43, white 28, colored 15. Churches 26.

YADKIN.

Yadkin county lies immediately north of Davie, in the bend of the Yadkin river, which bounds it northward and eastward. It is traversed in a nearly east and west course by the Brushy mountains, which here drop down into low spurs and swells, the average elevation of the county being probably not greater than 1,200 feet. Its soils and forests are like those of Davie county. Its agricultural interest is divided between the production of tobacco and grain crops, the product of the latter

nearly reaching half a million bushels. Cotton culture has invaded its southern border to a small extent within a few years. There are several iron mines in the county, but they have been little worked, as they are too far from market. Of the county area, 23.51 per cent. is tilled land, of which 0.16 per cent. is planted in cotton.

No railroad has yet reached the county.

Population 12,420—White 10,876, colored 1,544. Area 351 square miles, woodland 89,582 acres. Tilled lands 52,816 acres, area planted in cotton 87 acres, in tobacco 425 acres, in corn 21,735 acres, in wheat 10,190 acres, in rye 821 acres, in oats 11,289 acres. Cotton production 26 bales, average cotton product per acre, 0.30 bale, 426 pounds seed-cotton, or 142 pounds cotton lint. Real property, aggregate value, \$855,630, personal property \$452,416, total \$1,318,046. State taxes \$199.78, county taxes \$17,455.20, school taxes \$3,482.41. Live stock—Horses 1,412, mules 885, cattle 5,267, hogs 10,275, sheep 3,630. Public schools 59, white 48, colored 11. Churches 17.

SURRY.

Surry is a north border county, contiguous to the Blue Ridge, and belongs to the Piedmont section of the State. The Yadkin river is its southern boundary. Its western section is quite mountainous, and there are small mountains in the middle, so that its surface is quite broken, and its average elevation is nearly 1,400 feet. Its soils and forests are like those of the neighboring counties, Stokes and Forsyth, the high slaty ridges and mountains, as well as much of the rolling surface, having a light gray, sandy loam soil and forests of oak and pine, with sourwood and chestnut, while the better tracts of reddish clay loams have a predominant growth of oaks, hickory, poplar, etc., with little or no pine.

The agriculture of the county is like that of Stokes, tobacco of the better grades being the chief market crop, but of greatly less value than the grain product, which exceeds 500,000 bushels. The water power of the county is notable, a number of large tributaries of the Yadkin crossing its territory with a fall of several hundred feet. This is a feature common to the whole Piedmont region. There are several cotton factories and iron mines and forges in the county. Of the county area, 22.65 per cent. is tilled land, of which only an insignificant portion is cultivated in cotton.

Population 15,302—White 13,227, colored 2,075. Area 476 square miles, woodland 188,631 acres. Tilled lands 69,011 acres, area planted in cotton 3 acres, in tobacco 2,136 acres, in corn 25,334 acres, in wheat 9,823 acres, in rye 3,027 acres, in oats 9,199 acres, in buckwheat 71 acres. Cotton production 1 bale, average cotton product per acre 0.33 bale, 474 pounds seed-cotton or 158 pounds cotton lint. Real property, aggregate value \$1,118,660, personal property \$499,082, total \$1,617,742. State taxes \$308.93, county taxes \$9,136.64, school taxes \$5,130.60. Live stock—Horses 1,501, mules 831, cattle 6,116, hogs 12,222, sheep 6,532. Public schools 86, white 68, colored 18. Churches 16.

WILKES.

Wilkes county lies west of Surry, and differs from it only in being more mountainous and rugged and having a greater average elevation—not less than 1,500 feet. Its northern margin rests on the summits of the Blue Ridge (at an elevation of from 3,000 to 4,000 feet), its southern on the Brushy mountains (from 2,000 to 2,500 feet above sea level), and its whole surface is carved into a succession of mountain ridges and narrow intervening valleys by the Yadkin and its numerous tributaries. Its agriculture and its forests may be described in the same terms as were those of Surry, except that, with the increase of elevation, the growth of chestnut increases, and a new forest element enters, to a small extent, in the white pine (*P. strobus*), both in the South mountains and on the flanks of the Blue Ridge. Along the margin of the Yadkin river and its larger tributaries are frequent and wide tracts of sandy and clay bottom lands. In various parts of the county are small areas of reddish clay soil, but much the larger part of it shows the average oak upland soil, yellow or gray sandy loam. The lighter soils are well adapted to the highest grades of tobacco, the culture of which begins to enter largely into its agriculture. Of the county area 20.10 per cent. is tilled land, of which only 0.13 per cent. is planted in cotton. The water power of the county is very large, the sources of its multitude of rivers having an elevation of from 2,000 to 3,000 feet above tide, and their mouths less than 1,000 feet.

Population 19,181—White 17,257, colored 1,924. Area 626 square miles, woodland 268,834 acres. Tilled lands 80,512 acres, area planted in cotton 107 acres, in tobacco 110 acres, in

corn 34,865 acres, in wheat 9,515 acres, in rye 5,236 acres, in oats 8,240 acres, in buckwheat 218 acres. Cotton production 29 bales, average cotton product per acre 0.27 bale, 387 pounds seed-cotton, or 129 pounds cotton lint. Real property, aggregate value \$913,942, personal property \$517,535, total \$1,431,477. State taxes \$193.35, county taxes \$3,840.02, school taxes \$6,507.88. Live stock—Horses 1,867, mules 947, cattle 9,760, hogs 19,104, sheep 10,642. Public schools 80, white 72, colored 8. Churches 27.

ALEXANDER.

Alexander, one of the smallest counties in North Carolina, lies south of Wilkes, and is separated from it by the chain of the Brushy mountains. A large part of this county is traversed or penetrated by spurs and high ridges thrown off southward from that range, many of which rise to the elevation of 2,000 feet, and its territory is drained southward by the tributaries of the Catawba. The southeastern section, as well as the middle, is characterized largely by oak forests, with red-clay soils, the higher divides and ridges and spurs showing a large admixture of pine and chestnut and a more open, light colored, and sandy soil. The northern, western, and northeastern sections are quite broken and mountainous. The culture of cotton has entered the territory of this county within the last few years, though its product amounts to but a few scores of bales. Tobacco is cultivated to some extent on the lighter soils, but corn and wheat are the principal products. It has ample, but undeveloped, water-power, and it has iron-ore beds of considerable extent, as well as a great variety of other minerals. Of the county area, 26.51 per cent. is tilled land, of which 1.49 per cent. is planted in cotton.

Population 8,355—White 7,458, colored 897. Area 245 square miles, woodland 82,690 acres. Tilled lands 41,572 acres, area planted in cotton 617 acres, in tobacco 28 acres, in corn 16,789 acres, in wheat 6,376 acres, in rye 760 acres, in oats 7,503 acres. Cotton production 182 bales, average cotton product per acre, 0.29 bale, 420 pounds seed-cotton, or 140 pounds cotton lint. Real property, aggregate value \$650,034, personal property \$329,409, total \$979,443. State taxes \$102.49, county taxes \$2,663.66, school taxes \$2,915.83. Live stock—Horses 912, mules 944, cattle 4,221, hogs 7,632, sheep 4,614. Public schools 48, white 40, colored 8. Churches 25.

CALDWELL.

Caldwell county lies upon the flanks of the Blue Ridge, and extends southward beyond the Brushy mountains, a smaller and parallel range 2,000 feet and more in altitude. It is drained by the upper tributaries of the Catawba river and of the Yadkin, the larger of which rise in the summits of the Blue Ridge and its culminating region in Grandfather mountain, which touches the elevation of nearly 6,000 feet above the sea. This mountain throws off a number of long, heavy spurs down to the middle of the county, and is traversed midway in a direction parallel to the other two chains by the Warrior mountains, so that its surface is for the most part quite broken and rugged; but the different chains are separated by extensive open valleys, and there is a great area of river and creek bottoms. The lands in the middle and southern sections generally have a red clay or yellow sandy loam soil of more than medium fertility, while its higher regions, on the ridges and spurs of the mountains, are frequently slaty ledges, with gray sandy and gravelly soils of medium to low quality. Its forests are predominantly of oak in the middle section and of pine and oak in the southern and northern—that is, in the more mountainous regions, while, in the latter section, white pine, hemlock and chestnut constitute a considerable element of the forest growth. The chief crops are grain, but tobacco culture has been recently introduced, and for a few years past a few bales of cotton have been raised in an experimental way. Of the county area, 13.10 per cent. is tilled land, of which 0.07 per cent. is cultivated in cotton. Of minerals the county contains gold and iron, the former in both placers and veins.

Transportation is furnished by the Western North Carolina railroad, which crosses the neighboring counties south, and a narrow-gauge road is finished to the centre of the county.

Population 10,291—White 8,691, colored 1,600. Area 495 square miles, woodland 151,637 acres. Tilled lands 41,512 acres, area planted in cotton 30 acres, in tobacco 75 acres, in corn 17,315 acres, in wheat 8,211 acres, in rye 684 acres, in oats 3,886 acres. Cotton production 12 bales, average cotton product per acre 0.40 bale, 570 pounds seed-cotton or 190 pounds cotton lint. Real property, aggregate value \$752,146, personal property \$473,387, total \$1,225,533, State taxes \$201.82, county taxes \$4,310 71, school taxes \$3,135.04. Live stock—Horses 1,088, mules 953, cattle 5,111, hogs 11,517, sheep 5,332. Public schools 45, white 37, colored 8. Churches 24.

BURKE.

Burke county lies westward of Caldwell on both sides of the Catawba river, which traverses its middle section and drains its entire territory. Its southern flank lies upon the crests of the South mountains, which here reach an elevation of over 3,000 feet above the sea and send off spurs in a northerly and northeasterly direction almost to the middle of the county. The northern end is elevated upon two of the most massive spurs of the Blue Ridge, Linville and Table Rock, which here rise to an elevation of nearly 4,000 feet; and from this are thrust out numerous long and rugged spurs and ridges in a southeasterly course. A large part of the territory of this county, therefore, is mountainous, and the average elevation is not less than 1,300 feet. In its middle section are considerable tracts of red-clay soils, with forests predominantly of oak, hickory, etc., while the remainder of the county is characterized in this respect by mixed forests of oak, pine, chestnut, etc., with white pine in the mountains of the south and north. The river and creek bottoms are very extensive and fertile, and have light-colored clays, loams, and sandy soils. In the middle section, on both sides of the river, the uplands usually have a red-clay soil and oak forests. The other parts of the county have soils of a lighter color, yellowish to gray loams, and forests of the usual mixed character of the region—oak, pine, chestnut, sourwood, dogwood, etc. Placer gold mines are numerous in the South mountains, and there are several vein mines on the north side of the county. Cotton and tobacco have been added to the list of cultivated crops within a few years, but grain forms the chief crop, and has an aggregate yield of 400,000 bushels. Of the county area, 13.59 per cent. is tilled land, of which 1.78 per cent. is planted in cotton.

Transportation is by rail, east and west.

Population 12,809—White 10,088, colored 2,721. Area 489 square miles, woodland 129,089 acres. Tilled lands 42,545 acres, area planted in cotton 752 acres, in tobacco 58 acres, in corn 22,613 acres, in wheat 10,016 acres, in rye 1,054 acres, in oats 3,455 acres. Cotton production 361 bales, average cotton product per acre 0.48 bale, 684 pounds seed-cotton, or 228 pounds cotton lint. Real property, aggregate value \$670,983, personal property \$535,782, total \$1,006,765. State taxes \$254.73, county taxes \$13,548.65, school taxes \$3,426.21. Live stock—Horses 1,249, mules 968, cattle 5,005, hogs 7,822, sheep 4,126. Public schools 61, white 48, colored 13. Churches 22.

McDOWELL.

McDowell county lies on the eastern flank of the Blue Ridge near its highest parts, which exceeds in this region an elevation of 5,500 feet, and its whole territory may be described as mountainous. Its average elevation is more than 1,500 feet, and it is for the most part drained by the headwaters of the Catawba river. The southern and broader end of its triangular territory is traversed east and west by the South mountains, a long eastward projection or spur from the Blue Ridge. Along the course of the Catawba river and some of its chief tributaries are wide tracts of sandy and alluvial bottoms, which are very productive. The hilly and mountainous tracts have the usual variety of gray and yellowish oak uplands soils of medium fertility and mixed forests of oak, pine, chestnut, etc. Reddish clay loam soils, with a preponderant oak forest, are found in patches here and there in the middle and southeastern sections. A large proportion of the soils of the county are well adapted to the better grades of tobacco, and the agriculture of the county has the great advantage of an abundance of limestone in the northern and middle sections. Gold mining in the South mountains has long been an important industry, several mica mines having been opened, and some attention is given to lumbering. There is a large amount of valuable timber on the slopes of the Blue Ridge and in the mountain coves, which must become the foundation of important manufactures, and then there is an indefinite amount of water power. Iron ores of low grade are abundant. Of the county area 9.98 per cent. is tilled land, of which 0.07 per cent. is planted in cotton.

Transportation is by rail, east and west.

Population 9,836—White 7,936, colored 1,897. Area 545 square miles, woodland 122,129 acres. Tilled lands 34,798 acres, area planted in cotton 23 acres, in tobacco 100 acres, in corn 17,675 acres, in wheat 6,397 acres, in rye 1,360 acres, in oats 1,690 acres. Cotton production 9 bales, average cotton product per acre 0.39 bale, 558 pounds seed-cotton, or 186 pounds cotton lint. Real property, aggregate value \$629,014, personal property \$179,260, total \$808,274. State taxes \$189,29, county taxes \$10,559.85, school taxes \$2,630.84. Live stock—Horses 800, mules 710, cattle 5,125, hogs 5,013, sheep 3,125. Public schools 49, white 38, colored 11. Churches 22.

POLK.

Polk is the southernmost of the Piedmont counties, lying upon the border of South Carolina, and of the cotton belt, which barely enters its southeastern corner. Three-fourths of the territory of the county is very mountainous, as it is bounded westward by the Blue Ridge, and its western and northern sections are penetrated by heavy and long spurs, thrown out from that range, of equal height or greater. It is crossed from west to east and nearly its entire territory is drained by the waters of Green river, one of the principal tributaries of the Broad. Along this river valley, as well as on some of the tributaries, are wide stretches of bottom lands of clay and sandy loams. The middle part of the county is a somewhat broken plateau of 1,000 feet elevation, and has a gravelly and slaty soil of a light color and loose texture and low fertility, and inferior forests of pine, oak, and chestnut. The southeastern section is of the same character. A large part of the uplands and of the mountain slopes in the west and north has forests largely of oak and a yellowish or gray loamy soil of good quality. In the higher parts, except where the soil is of the better grades, chestnut and chestnut oak are abundant. The principal agricultural pursuit is the production of grain crops, cotton being a new crop to the region, and as yet little cultivated. There are several gold mines in the middle and southern sections. Of the county area 12.78 per cent. is tilled land, of which 7.83 per cent. is planted in cotton. Produce is shipped south by rail.

Population 5,062—White 3,918, colored 1,144. Area 257 square miles, woodland 72,813 acres. Tilled lands 21,027 acres, area planted in cotton 1,646 acres, in corn 10,632 acres, in wheat 1,896 acres, in rye 606 acres, in oats 877 acres. Cotton production 362 bales, average cotton product per acre 0.22 bale, 312 pounds seed-cotton, or 104 pounds cotton lint. Real property, aggregate value \$508,683, personal property \$333,817, total \$842,500. State taxes \$82.50, county taxes \$5,844.62, school taxes \$2,358.25. Live stock—Horses 387, mules 431, cattle 2,768, hogs 4,565, sheep 1,714. Public schools 33, white 22, colored 11. Churches 18.

THE TRANSMONTANE REGION.

(Embraces the following counties: Alleghany, Ashe, Watauga, Mitchell, Yancey, Madison, Buncombe, Henderson, Transylvania, Haywood, Jackson, Macon, Swain, Graham, Clay and Cherokee.)

ALLEGHANY.

Alleghany county is situated on the Virginia border, and is bounded southward by the curves of the Blue Ridge. In its middle section is a parallel and higher chain. Its entire surface is drained northward into the New and Kanawha rivers, this, with the two following counties, constituting the New River plateau or basin, the only part of the State drained by the Ohio. It lies on the northeastern end of the long, narrow, elevated transmontane plateau, and has an average elevation of not less than 2,800 feet. Its forests are of oak, chestnut and pine, with an admixture of white pine in the coves of the Blue Ridge and between that and the Peach Bottom range. Its soils are the common gray and yellow upland loams. Along the banks of the New river and its principal tributaries, especially Little river, are considerable tracts of bottom lands. Its agriculture is divided between the production of grains and grasses and cattle raising. Its products of buckwheat and rye are next to the largest in the State. Of the county area, 26.15 per cent. is tilled land.

Population 5,486—White 4,967, colored 519. Area 276 square miles, woodland 74,859 acres. Tilled lands, 46,198 acres, area planted in cotton none, in corn 7,201 acres, in wheat 1,760 acres, in rye 3,121 acres, in oats 1,933 acres, in buckwheat 755 acres. Real property, aggregate value \$407,340, personal property \$125,392, total \$532,732. State taxes \$38.10, county taxes \$2,663.66, school taxes \$2,915.83. Live stock—Horses 1,150, mules 150, cattle 4,822, hogs, 3,600, sheep 5,067. Public schools 33, white 29, colored 4. Churches 14.

ASHE.

Ashe county lies in the northwestern corner of the State, adjoining the States of Virginia and Tennessee, its southeastern edge resting upon the summits of the Blue Ridge mountain

chain. It is very rugged and mountainous, the spurs of the Smoky mountains being thrust out almost across its entire territory and reaching at various points an elevation of nearly 5,000 feet, giving an average elevation of 3,500 feet above tide. It is drained by the two forks of New river, which meet in its northeast corner. Its forests, soils, and agriculture resemble those of Alleghany county. Grass and cattle count for much in this region, and rye and buckwheat are its common crops, as well as of Alleghany and the whole transmontane plateau. In the former (rye) this county shows the largest product in the State, and in the second it is nearly equal to the best. White pine and hemlock, as well as poplar, sugar maple, wild cherry, and walnut, become important constituents of the forests in many places. Of the county area 29.65 per cent. is tilled land.

Population 14,437—White 13,471, colored 966. Area 370 square miles, woodland 166,973 acres. Tilled lands 70,207 acres, area planted in cotton none, in tobacco 60 acres, in corn 15,616 acres, in wheat 5,473 acres, in rye 4,685 acres, in oats 3,357 acres, in buckwheat 818 acres. Real property, aggregate value \$759,123, personal property \$580,775, total \$1,339,898. State taxes \$161.94, school taxes \$3,863.95. Live stock—Horses 2,544, mules 468, cattle 12,005, hogs 12,508, sheep 13,236. Public schools 86, white 80, colored 6. Churches 12.

WATAUGA.

Watauga county occupies the whole breadth of the narrower part of the transmontane plateau, being bounded for the most part northwestward by the Smoky range and southeastward by the Blue Ridge. It is traversed in a northerly course by two massive cross-chains connecting the summits of the Blue Ridge and Smoky mountains, the Rich mountains and the chain of Hanging Rock and Beech. Its average elevation would about equal that of Ashe county—3,500 feet. Its whole surface is rugged and mountainous, with the exception of a few limited tracts along the two principal rivers, where considerable valleys open out, with occasional stretches of bottom lands. The soils and forests, as well as the predominant agricultural features of this county, are like those of Ashe county. There is great abundance of chestnut in its forests, and on the Rich mountains there are great quantities of linden (*Tilia*). Its high levels and benches are the best grass lands in the

State, and in consequence cattle-raising enters largely into its agriculture. It also produces corn and small grains in considerable quantities, including wheat, rye, and buckwheat, the county leading in the last-named crop. Of the county area, 18.89 per cent. is tilled land, of which very little is cultivated in cotton.

Population 8,160—White 7,746, colored 414. Area 370 square miles, woodland ——— acres. Tilled lands 44,753 acres, area planted in cotton 10 acres, in corn 8,227 acres, in wheat 2,957 acres, in rye 2,387 acres, in oats 1,828 acres, in buckwheat 951 acres. Cotton production 3 bales, average cotton product per acre 0.30 bale, 429 pounds seed-cotton, or 143 pounds cotton lint. Real property, aggregate value \$771,975, personal property \$423,522, total \$1,195,497. State taxes \$96.18, county taxes \$3,427.04, school taxes \$3,171.67, Live stock—Horses 1,516, mules 515, cattle 7,099, hogs 7,924, sheep 8,941. Public schools 44, white 42, colored 2. Churches 19.

MITCHELL.

Mitchell county is a continuation of the southern Appalachian plateau, and with Yancey, the next county described, occupies the basin of the Nolechucky or Toe river, which drains the highest masses and summits of the Blue Ridge and Black mountains. On its northern border the Smoky mountains reach an elevation of 6,400 feet, while the Blue Ridge, which forms its southeastern boundary, has an elevation ranging from 3,000 to nearly 6,000 feet. Its surface is for the most part very mountainous, and has an elevation which would probably reach an average of 3,000 feet above the sea.

The mountains of this county, as well as those of the other parts of the plateau, are generally covered with heavy forests of oak, chestnut, and pine, with a mixture here and there in the coves and on the higher slopes of white pine, hemlock (*Abies Canadensis*), and black birch, while the lower slopes are covered with linden (two species), sugar maple, poplar, walnut, cherry, ash, etc.

The soils of this county vary in their texture and composition, and belong to the general region of oak uplands soils, being for the most part gray and yellow gravelly and sandy loams, with occasional strips of red lands. The mountains here, as in the two preceding counties, are generally covered to their summits with a fertile soil and heavy forests, the ex-

ception being some of the higher dome-like masses of the Smoky mountains (notably the Roan), which are bald upon their summits, and are, in fact, simply prairies. The average elevation of this county above the sea will exceed 3,000 feet. Its agriculture resembles that of the two preceding counties, the conditions being well adapted for the most part to cattle-raising, as well as to the production of grain crops. Tobacco culture has recently been introduced, but mica mining is the most important and profitable industry, while along its northern border are some of the finest iron-ore beds known. The first southern mica mines were opened here in 1868. Of the county area, 12.46 per cent. is tilled land, of which 0.05 per cent. is cultivated in cotton.

Population 9,435—White 8,932, colored 503. Area 401 square miles, woodland 105,586 acres. Tilled lands 31,975 acres, area planted in cotton 15 acres, in tobacco 77 acres, in corn 11,894 acres, in wheat 3,374 acres, in rye 1,358 acres, in oats 3,990 acres, in buckwheat 378 acres. Cotton production 6 bales, average cotton product per acre, 0.40 bale, 570 pounds seed-cotton, or 190 pounds cotton lint. Real property, aggregate value \$364,037, personal property \$119,485, total \$483,522. State taxes \$165.38, county taxes \$3,494.02, school taxes \$2,655.40. Live stock—Horses 1,094, mules 321, cattle 3,521, hogs 6,810, sheep 3,964. Public schools 40, white 37, colored 3. Churches 48.

YANCEY.

The description of Mitchell, the preceding county, applies to Yancey. It completes with that the basin of the Toe river or Nolechucky, one of the main affluents of the Tennessee river. The massive spur of the Black mountains rises in the middle of its southern end and projects northward almost to its centre. This spur reaches an elevation in its middle portion of nearly 7,000 feet, and is the highest mountain east of the Mississippi river. Between this mountain spur and the Blue Ridge is a deep, narrow valley, in which rises and flows South Toe river, while on its westward flanks rises, in a similar gorge, Caney river, another of the confluent of the Nolechucky. The county is bounded on the southwest by a cross-chain from the Blue Ridge to the Smoky mountains, the northwest Black mountains, which, through a considerable part of its course, reaches an elevation of 5,000 feet and upward. The whole territory of this county, therefore, is exceedingly rugged and mountainous,

and the larger part of its surface is adapted only to grazing; but in the valleys and troughs between the mountain spurs and ranges are considerable stretches of undulating and hilly land and occasional tracts of considerable extent of bottom land, which are very productive in corn and small grains. The culture of tobacco has also penetrated into this county within the last few years. The tilled land occupies 19.65 per cent of the county area. The timbers and soils are similar to those of Mitchell county, and mica mining holds here a similar place of importance. Above 5,000 feet the principal growth on the Black mountains is two species of fir, *Abies Fraseri* and *A. nigra* (spruce). These trees are also found on the summits of the Roan and Grandfather, and farther west on the Balsam mountains. Lumber mills have multiplied very rapidly in the great forests of the last three counties, and enormous quantities of cherry, walnut, ash, sugar-maple and poplar lumber have been manufactured and exported in the last year.

Population 7,694—White 7,369, colored 325. Area 276 square miles, woodland 109,776 acres. Tilled lands 34,703 acres, area planted in cotton, none, in tobacco 84 acres, in corn 11,200 acres, in wheat 3,940 acres, in rye 1,290 acres, in oats 3,657 acres. Real property, aggregate value \$259,441, personal property \$238,590, total \$498,031. State taxes \$110.53, county taxes \$5,084.46, school taxes \$2,017.04. Live stock—Horses 1,077, mules 595, cattle 4,824, hogs 7,326, sheep 4,338. Public schools 37, white 35, colored 2. Churches 12.

MADISON.

Madison county, with Buncombe, Henderson and Transylvania, make the plateau or basin of the French Broad the largest of these natural subdivisions of the plateau. It is bounded northward by the Smoky mountains. Its territory is also very rugged and broken, being not only surrounded by heavy, massive chains of mountains, but crossed and cut up by heavy spurs of those principal chains. Its soils, forests and agricultural productions are like those of the preceding counties, except that bright yellow tobacco has recently become its most important crop, and already nearly reaches a million pounds per annum. It has also a larger proportion of white pine in its forests, and its iron-ore deposits are extensive and valuable. Of the county area, 19.66 per cent. is tilled land, of which 0.02 per cent. is cultivated in cotton.

Population 12,810—White 12,351, colored 459. Area 457 square miles, woodland 157,618 acres. Tilled lands 57,490 acres, area planted in cotton 12 acres, in tobacco 1,626 acres, in corn 17,816 acres, in wheat 7,702 acres, in rye 816 acres, in oats 4,238 acres. Cotton production 4 bales, average cotton product per acre 0.33 bale, 474 pounds seed-cotton, or 158 pounds cotton lint. Real property, aggregate value \$714,477, personal property \$482,970, total \$1,197,441. State taxes \$455.91, county taxes \$13,762.76, school taxes \$3,870.47. Live stock—Horses 1,496, mules 1,037, cattle 7,455, hogs 12,027, sheep 7,152. Public schools 49, white 48, colored 1. Churches 20.

BUNCOMBE.

Buncombe county occupies the middle portion of the French Broad valley. Its eastern border lies upon the summits of the Blue Ridge and the Black mountains, and its western upon the summits of the cross-chain called the Newfound mountains. The valley of the French Broad here is a wide, open basin, with considerable tracts of undulating and hilly land and moderately mountainous tracts, while along its margin on every side are heavy mountain spurs. The forests and soils are of the usual familiar description, and the agriculture resembles in its main features that of the Piedmont division, consisting chiefly of the production of grains, of which the total is 650,000 bushels, and to a moderate (but rapidly increasing) extent of tobacco. Cattle-raising occupies a subordinate position. The tilled lands occupy 19.75 per cent. of the county area. The crossing of two great railroad lines at Asheville, in the centre of the county, gives it a commanding commercial position, and it is the centre of a great summer travel. The average elevation of the French Broad plateau is about 2,500 feet.

Population 21,909—White 18,422, colored 3,487. Area 614 square miles, woodland 226,454 acres. Tilled lands 77,628 acres, area planted in cotton 1 acre, in tobacco 947 acres, in corn 29,108 acres, in wheat 17,501 acres, in rye 2,966 acres, in oats 6,967 acres, in buckwheat 575 acres. Real property, aggregate value \$2,598,483, personal property \$1,112,974, total \$3,711,457. State taxes \$1,579.42, county taxes \$29,569.44, school taxes \$9,066.18. Live stock—Horses 2,782, mules 1,495, cattle 12,363, hogs 11,981, sheep 8,888. Public schools 94, white 80, colored 14. Churches 62.

HENDERSON.

Henderson county is a continuation southward of the French Broad valley described in Buncombe county, and its topographical features are very similar, except that there are broader areas of comparatively level and undulating lands, but of less fertility, the soils being predominantly light gray gravelly loams, and its forests being mixed growths of oak and pine, with hemlock and chestnut. Near the water courses, in the mountain coves, are found walnut, cherry, maple, and occasionally white pine. The chief productions of this county are corn and small grains, the culture of tobacco being very recently introduced, and then only to a very small extent. There is a large aggregate surface of bottom lands in the county, those on the French Broad being very extensive and fertile. Of the county area 17.18 per cent. is tilled land, of which 0.03 per cent. is cultivated in cotton.

Transportation is southward by rail.

Population 10,281—White 8,893, colored 1,388. Area 351 square miles, woodland 106,441 acres. Tilled lands 38,595 acres, area planted in cotton 10 acres, in tobacco 29 acres, in corn 16,407 acres, in wheat 2,598 acres, in rye 3,734 acres, in oats 2,908 acres, in buckwheat 107 acres. Cotton production 4 bales, average cotton product per acre 0.40 bale, 570 pounds seed-cotton, or 190 pounds cotton lint. Real property, aggregate value \$991,049, personal property \$402,938, total \$1,393,987. State taxes \$448.58, county taxes \$15,680.85, school taxes \$3,520.28. Live stock—Horses 1,070, mules 478, cattle 5,672, hogs 7,070, sheep 7,175. Public schools 53, white 42, colored 11. Churches 24.

TRANSYLVANIA.

Transylvania county occupies the upper portion of the valley of the French Broad, and lies along the flanks of the Blue Ridge and on the southern border of the State. It is bounded westward by a heavy cross-chain from the Blue Ridge to the Smoky mountains, the Balsam mountains, which rises throughout a considerable part of its course above 6,000 feet. This county is therefore the most elevated portion of the plateau of the French Broad. It is mostly mountainous and rugged, with spurs and knobs of mountains thrust out from the cross-chains which bound it. There are very extensive tracts of bottom lands along the tortuous course of the French Broad,

reaching often a breadth of 1 or 2 miles, which are very fertile and produce immense crops of corn. The larger portion of the county, however, is only adapted to grazing. Its forests resemble those of the plateau generally, but contain a larger intermixture of white pine, as well as of hemlock, sugar maple, walnut, and cherry. The tilled lands occupy 7.35 per cent. of the county area.

Population 5,340—White 4,823, colored 517. Area 382 square miles, woodland 77,815 acres. Tilled lands 17,967 acres, area planted in cotton none, in corn 9,762 acres, in wheat 869 acres, in rye 3,289 acres, in oats 257 acres. Real property, aggregate value \$421,357, personal property \$182,008, total \$603,365. State taxes \$80.76, county taxes \$6,712.50, school taxes \$1,621.57. Live stock—Horses 651, mules 321, cattle 5,077, hogs 6,497, sheep 5,003. Churches 12.

HAYWOOD.

Haywood county occupies the plateau or basin between the parallel cross-chains of the Newfound and the Balsam mountains which lie at right angles to the main chains (the Blue Ridge and Smoky) at an average distance from each other of about 20 miles.

This basin is drained by the waters of Pigeon river, one of the tributaries of the French Broad, which enters it beyond the Smoky mountains in Tennessee. This county is hemmed in on all sides by high mountain chains of 3,000, 5,000 and 6,000 feet and more above the sea. Its territory is exceedingly broken and rugged; yet there are considerable tracts of open, moderately hilly lands along the water courses, and occasional wide stretches of fertile bottoms, especially on the upper confluent of the river and near the middle of the basin. The average elevation is above 3,000 feet.

The soils are of the usual description, and are above average fertility. It is one of the best grazing sections, and produces all the grain crops of the region, including rye and buckwheat, but, as yet, little tobacco. The mountains are clothed to their summits with forests of a great range of species. On the lower slopes and in the rich coves, besides the usual characteristic oaks, hickories, cucumbers, poplar, chestnut, etc., are found in abundance walnut, black locust, cherry and ash, and a little higher sugar maple, linden, black birch and beech, and on the highest ranges two species of fir. Since

the advent of the railroad lumbering is rapidly becoming an important industry. The tilled land occupies 10.87 per cent. of the county area.

Population 10,271—White 9,787, colored 484. Area 582 square miles, woodland 115,632 acres. Tilled lands 40,474 acres, area planted in cotton none, in tobacco 100 acres, in corn 17,254 acres, in wheat 10,054 acres, in rye 757 acres, in oats 4,099 acres, in buckwheat 633 acres. Real property, aggregate value \$1,061,105, personal property \$513,581, total \$1,574,686. State taxes \$309.05, county taxes \$9,531.83, school taxes \$3,712.98. Live stock—Horses 1,729, mules 675, cattle 8,588, hogs 10,794, sheep 7,643. Public schools 57, white 47, colored 4. Churches 21.

JACKSON.

Jackson county is quite similar to Haywood in its topographical and agricultural features, but is more rugged, and has less open bottom and valley land. It occupies the basin of the Tuckasegee river, a tributary of the Tennessee, lies west of the Balsam mountains, is bounded by the Cowee cross-chain on the west and extends south to the Blue Ridge, and includes a high plateau beyond it of nearly 100 square miles, with an elevation of from 3,500 to 4,000 feet above sea level. The county is well adapted to the production of grass. The soils, forests, and productions are like those of Haywood. Mica is mined in the county in many places, and gold is found on the plateau south of the Blue Ridge. Of the county area 8.4 per cent. is under tillage, and of this 0.06 per cent. is in cotton. A railroad has been recently graded across the county.

Population 7,343—White 6,591, colored 752. Area 532 square miles, woodland 136,317 acres. Tilled lands 28,606 acres, area planted in cotton 16 acres, in corn 12,793 acres, in wheat 4,217 acres, in rye 1,583 acres, in oats 1,521 acres, in buckwheat 175 acres. Cotton production 6 bales, average cotton product per acre 0.38 bale, 534 pounds seed-cotton, or 178 pounds cotton lint. Real property, aggregate value \$479,079, personal property \$224,126, total \$703,205. State taxes \$121.40, county taxes \$5,504.82, school taxes \$1,988.65. Live Stock—Horses 1,042, mules 540, cattle 5,821, hogs 9,146, sheep 4,907. Public schools 36, white 33, colored 3. Churches 9.

MACON.

Macon county occupies the valley of the Tennessee river, which flows through its centre from beyond the Georgia border, on the south, toward the Smoky mountains. This is a wide, open valley, along which are considerable bodies of comparatively level and hilly lands, with extensive bottoms along the river and its principal tributaries, recalling in its general features the basin of the French Broad, though much less extensive. The county is better adapted to the cultivation of grains and has a larger area capable of such cultivation than the neighboring counties; but a large part of its territory is very mountainous, being hemmed in on all sides by high mountain ranges. Along its western side lies the massive chain of the Nantehaleh mountains, with its numerous heavy, ragged spurs, and on the western margin is a deep cañon, drained by the river of the same name. There are two notable plateaus in the south end of the county on the summit of the Blue Ridge, one on the headwaters of the east fork of the Tennessee, and the other on those of the Nantehaleh, both of them ranging from 3,500 to 4,000 feet in altitude.

The larger part of the area of the county is, therefore, better adapted to grazing than to anything else. The soils and forests are like those of the counties above described. The tilled land comprises 9.46 per cent. of the county area. The culture of tobacco has been recently introduced to a small extent, and mica mining is carried on extensively. There are also considerable deposits of iron ore, and the only extensive or profitable corundum mine in this country is found here. The beautiful red marble is found on the Nantehaleh river. A railroad has been recently graded across the northern end of the county.

Population 8,064—White 7,395, colored 669. Area 539 square miles, woodland 170,170 acres. Tilled lands 32,630 acres, area planted in cotton none, in tobacco 46 acres, in corn 14,423 acres, in wheat 5,565 acres, in rye 1,823 acres, in oats 1,621 acres. Real property, aggregate value \$582,911, personal property \$339,874, total \$922,785. State taxes \$256.79, county taxes \$6,335.68, school taxes \$4,323.60. Live stock—Horses 1,322, mules 786, cattle 6,918, hogs 11,020, sheep 7,492. Public schools 44, white 40, colored 4. Churches 25.

SWAIN.

Swain county lies north of Macon and Jackson, along the waters of the Tennessee river, and on the flanks of the great Smoky mountains on the north, which here reach their culmination in elevations of nearly 6,700 feet. With the exception of some open valley tracts the territory of this county is exceedingly rugged and broken. The proportion of cultivable land is very small. It is heavily timbered, even to the highest summits of the Smoky mountains, with the prevalent mountain forest growths. The higher levels of the Smoky mountains, about 5,000 feet above sea-level, are covered with forests of firs, while the more elevated coves abound in white pine and hemlock, and its deep gorges and lower slopes with maple, poplar, linden, hickory, chestnut, buckeye, walnut, magnolias and cherry. The summits of the high mountains furnish fine natural pasturage, and grazing has always been the chief industry. The approach of the railroad, which has been graded through its middle section, will speedily develop an extensive lumber interest. The tilled land occupies 4.86 per cent. of the county area.

Population 3,784—White 3,234, colored 550. Area 445 square miles, woodland 107,825 acres. Tilled lands 13,828 acres, area planted in cotton none, in corn 6,809 acres, in wheat 1,473 acres, in rye 515 acres, in oats 757 acres. Real property, aggregate value \$390,997, personal property \$112,225, total \$503,222. State taxes \$115.86, county taxes \$4,666.29, school taxes \$1,291.65. Live stock—Horses 548, mules 199, cattle 3,210, hogs 4,375, sheep 3,192. Churches 9.

GRAHAM.

Graham county, lying south of the Tennessee river, is bounded on the west by the Smoky mountains and on the south by a high cross-chain called Long Ridge. It resembles Swain county very closely in its physical as well as its agricultural features. Its forests are a continuation of those of Swain, except that the mountains here do not reach the elevation necessary to produce the fir. There is some open valley and hilly land on the Cheowah river and its tributaries, which drains most of its surface. Its population is small, and its agriculture little developed, as there are no accessible markets. Its

soils and timber are capable of becoming the basis of thriving industries as soon as the projected Rabun Gap and Knoxville railroad shall be completed. The tilled land occupies 18 per cent. of the county area.

Population 2,335—White 2,123, colored 212. Area 307 square miles, woodland 43,767 acres. Tilled lands 8,212 acres, area planted in cotton none, in corn 4,222 acres, in wheat 718 acres, in rye 566 acres, in oats 628 acres. Real property, aggregate value \$216,685, personal property \$82,268, total \$298,953. State taxes \$42.95, county taxes \$2,915.95, school taxes \$760.56. Live stock—Horses 333, mules 115, cattle 2,592, hogs 4,285, sheep 2,643. Public schools 13, white 13. Churches 7.

CLAY.

The small county of Clay, lying on the southern border, touches the State of Georgia, and is bounded on the east by Macon county, which it resembles very closely in all its features, physical and agricultural, and in its development. It is drained in a westerly direction by the Hiwassee river, which takes its rise in the Blue Ridge, in Georgia. Its eastern section lies upon the high plateau of the upper Nantehaleh river, and on the north lies the chain of the Koneteh mountains. A large part of its territory is very mountainous. It has fine, open valley lands on the river and its tributaries. Its southern section is hilly, somewhat mountainous, with fair agricultural capabilities. Both gold and mica are found, but have not been mined on any considerable scale. The tilled land occupies 12.45 per cent. of the county area.

Population 3,316—White 3,175, colored 141. Area 189 square miles, woodland 60,606 acres. Tilled lands 15,063 acres, area planted in cotton none, in tobacco 25 acres, in corn 7,810 acres, in wheat 3,282 acres, in rye 854 acres, in oats 1,230 acres. Real property, aggregate value \$201,459, personal property \$134,986, total \$336,445. State taxes \$86.45, county taxes \$3,003.27, school taxes \$980.81. Live stock—Horses 556, mules 466, cattle 3,300, hogs 4,536, sheep 3,475. Churches 14.

CHEROKEE.

Cherokee county occupies the extreme western corner of the State, of which it includes the whole breadth, at this point less than 20 miles. It is bounded in part on the north by the Smoky mountains, and touches the States of Tennessee and Georgia on the west and south. For the most part it resembles Clay county in its soils and agriculture. The valley of the Valley river is open and comparatively level, with extensive bottoms and bordering hilly lands. This valley is nearly 20 miles long and from 3 to 5 miles broad, and contains a large proportion of fine agricultural lands. The forests resemble those of the neighboring counties, and have been sufficiently described. Its agriculture is divided between the culture of grains and grasses and cattle-raising, and mines of gold, iron and soapstone have been opened and wrought for many years. The iron-ore deposits are of great extent, and there is a great variety of colored marble on Valley and Nantehaleh rivers which needs only transportation to become valuable. The tilled lands occupy 9.51 per cent. of the county area.

Population 8,182—White 7,796, colored 386. Area 470 square miles, woodland 149,156 acres. Tilled lands 28,603 acres, area planted in cotton, none, in tobacco 42 acres, in corn 14,507 acres, in wheat 4,317 acres, in rye 1,126 acres, in oats 1,534 acres. Real property, aggregate value \$529,925, personal property \$425,538, total \$955,463. State taxes \$106.40, county taxes \$7,379.34, school taxes \$2,029.83. Live stock—Horses 959, mules 460, cattle 6,381, hogs 8,241, sheep 7,016. Public schools 25, white 24, colored 1. Churches 21.

MINERALS.

Iron Ores.

The ores of iron are very widely distributed in this State, their occurrence being not only coëxtensive with the area of the Archæan (or Azoic) rocks, but extending over a part of the Mesozoic, and even into the Quaternary. And these occurrences include all the principal kinds of ore—Magnetite, Hematite, Limonite and Siderite, and most of their varieties and modifications. But as many of these forms occur in association or close proximity, it will avoid confusion to consider them by districts—to group them geographically. We begin with the most easterly occurrences.

Limonite Ores of the East.—The clayey, sandy and earthy accumulations of the Eastern Section, which have been previously described as Quaternary, contain in many places a rough, brown ore, more or less earthy, or sandy, either in beds two to three, or four feet in thickness, or more frequently in sheets, or layers of irregularly shaped lumps or nodules. One of the most considerable of these deposits occurs in the southern end of Nash county near the Wilson line. It lies on the mar-

gin of Toisnot swamp. The thickness is two to three feet, and its extent horizontally about fifty yards by one hundred and fifty. It is known as the Blomary Iron Mine, from the fact that iron had been made from this ore in a Catalan forge, a few miles south, during the war of 1812. Iron was also made here during the Confederate war in a furnace erected on the spot.

An analysis gives iron 42.73. This analysis places the ore among the best of its class.

A second deposit, reported to be abundant in superficial nodules and irregular lumps, is found in the southern part of Duplin county, near Wallace, on the farm of D. T. Boney.

Another bed of the same character and appearance, except in the size of the nodules, which are rather small, occurs in a field about two miles north of Rocky Point, in Pender.

Hematites of Halifax and Granville.—On the hills fronting the Roanoke, less than a mile below Gaston, are several outcrops of hematite ore. There are two principal beds, of which the lower only has been opened. The ore is granular for the most part, and of the variety known as specular, but contains a considerable percentage of magnetic grains disseminated through it. The principal bed is about twenty inches thick at the surface. It gave on analysis 63.76 per cent. of iron, and 0.09 of phosphorus.

About five miles southward from the above locality the same bed makes its appearance on the farm of Mr.

Hines; here, however, it is highly magnetic, fine grained and dense, although still showing the decidedly slaty structure of the first of the Gaston beds. At this point it is reported as three to four feet thick.

These ores are of conspicuous purity and obviously adapted to the manufacture of the higher grades of iron and of steel. And there is evidently a range of ore beds here of considerable extent.

Iron Ores of Johnston and Wake.—There is, according to Dr. Emmons, “a large deposit” of limonite four miles west of Smithfield.

Another “bluff” of limonite is referred to by Emmons as found at Whitaker’s, seven miles southwest of Raleigh, in Wake county.

Iron Ores of Chatham and Orange.—One of the best known and most important iron mines of this region is on the borders of Harnett, the *Buckhorn Mine*. It is about seven miles below the forks of the Cape Fear, on a hill nearly two hundred feet high, overlooking the river from the left bank. It is massive at the outcrop, and breaks out in large angular blocks. Some parts of the bed are slightly magnetic. The thickness is about thirty-six feet at this point, and diminishes to twenty at the lower quarries, two hundred to three hundred yards distant.

The ore is properly described as specular. The character of this ore is very like that of the Iron Mountain, Missouri, and its extent and mode of occurrence strongly suggest the Pilot Knob. It is at least equal to either of

these notable iron ore deposits in quantity, and is equally pure, and has the advantage of both in the presence of large percentages of manganese, and the capacity to produce *spiegeleisen* without admixture of other ores.

About one mile north of the *Buckhorn Mine* is a small vein about one foot thick, of a highly magnetic ore. An analysis of this ore, by Mr. C. E. Buck, gave 56.57 per cent. of iron and 1.51 of titanio acid.

Besides the localities already mentioned, a number of additional outcrops of ore have been noted, mostly magnetic; one, for example, two miles north of Buckhorn (at Dewar's), yielding 57.77 per cent. of iron (no phosphorus or sulphur), and three or four others in a southwest direction, for ten miles, to the head waters of Little river.

Near Haywood, in the angle formed by the junction of the Haw and Deep rivers, in the red sandstone of the Triassic, there has been opened a series of parallel beds of a red-ochreous earthy ore, on the lands of Dr. Smith. The only bed exposed at the time of my visit was twenty to twenty-five inches thick, dipping southeast with the sandstone, 20° to 30° . The ore has a rough likeness to the "Clinton" or "Fossil" ore of New York, &c., and the "Dystone" of Tennessee, but has a much coarser and more irregular texture. The ore is partly limonite, but seems to be largely changed to red hematite.

This ore makes its appearance again about a mile from Sanford, some twelve miles distant, where it was opened and worked to some extent during the late war. Only

one bed is exposed here, which is about twenty inches thick. The ore is easily dug and shoveled from the bed and crumbles into a heap of very coarse, reddish-brown gravel, a rough sort of *shot ore*.

The next ores demanding attention are the *Black Band* and *Ball ore*, or "kidney ore" of the coal measure. These are earthy and calcareous carbonates of iron, imbedded in the black carbonaceous shales which enclose the coal, or interstratify with the coal itself. These ores seem to be coëxtensive with the coal on Deep river, outcropping everywhere with it, and at several places outside of its limits.

Emmons also speaks of another seam of argillaceous carbonate as occurring at the depth of two hundred and thirty feet in the shaft at Egypt, and four occurrences of it are indicated as ball ore in the Egypt section. Emmons says of this argillaceous carbonate: "It contains 33 per cent. of metallic iron; the surface ores being altered contain 50 per cent.;" and he describes it as occurring "in balls, or in continuous beds." About the Gulf it occurs in rounded flattish masses, five or six to eight or ten inches in diameter. They are dense, uncrystalline and heavy, of a light gray to drab color, and are pretty thickly distributed in parallel layers of one to two or three feet thickness. An analysis of Prof. Schæffer, as given in Admiral Wilkes's report to the Secretary of the Navy in 1858, is as follows: Protoxide of iron, 40 per cent.; silica, 13; earthy matter 13; carbonaceous matter, 34. This is evidently a black band ore.

The seam of *black band* between the main coal beds in the Egypt shaft, is stated by Wilkes to be sixteen inches, the lower one to consist of two thicknesses of three feet each, separated by a thin seam of coal between. An analysis by Schæffer for Wilkes gives only 17 per cent. of iron, and 42 of carbonaceous matter; specific gravity 2.12.

The Evans vein is about six miles north of the Gulf, on the Graham road. It is six feet thick. This ore is a hematite.

But the most noted iron locality in Chatham county is known as *Ore Hill*. The ore is limonite, with the exception of one vein near the top and back of the hill, which is a hematite (in part specular), and much resembling the Evans ore. There is much of this ore on the surface in scattered fragments, indicating a vein of considerable extent, which, however, had not been exposed. Most of the other veins have been opened, but the pits and tunnels were so much filled and fallen in that no accurate measurements could be taken. But it was easy to see that two or three of them were very large—ten, fifteen feet, and upwards.

This ore was worked on a considerable scale during the American Revolution, and again during the late civil war, and the iron is reported to have been of good quality; and it is obviously an ore very readily smelted. The presence of the hematite vein and the proximity of the ball ore, which was successfully used as a flux in the last working of the furnace, furnish admirable conditions for advantageous iron manufacture.



A fine quality of magnetic ore, dense, metallic and very pure, is found on the east side of Haw river and about two miles distant, at the foot of Tyrrell's mountain on the farm of Mr. Snipes. The vein has not been fully exposed, but is reported to be three or four feet.

A very fine micaceous hematite is found near the mouth of Collins' creek a few miles above, in Orange county. It has not been explored, but surface fragments are reported to be abundant.

But the most notable ore bank yet opened in this county is that at Chapel Hill. It is a very dense, steel-gray hematite (specular in part), with slight magnetic indications. The vein is found on a hill one mile north from Chapel Hill, and more than two hundred feet above the creek at its base. The vein proper is seven to ten feet at the main shaft, and suddenly enlarging near the summit of the hill, just beyond the second shaft, to twenty-five and thirty feet. The hill top is covered with angular fragments of the ore of all sizes, up to more than one hundred pounds weight.

There is a second vein of the same character, five or six feet thick, crossing the main vein near the first shaft. The ore becomes poorer as the vein is followed beyond the summit of the hill northward, until at the distance of one hundred and fifty yards beyond the upper shaft, the quartzite predominates and the ore becomes poor. This mine is at the terminus of the State University Railroad, and has all the transportation facilities that are desirable.

There are surface indications on the neighboring hills, both north and south, for several miles, which show that this vein has a considerable extension; and in fact it may be considered as a continuation of the hematite veins of Deep river. And a magnetic ore makes its appearance about twenty miles northeastward, three miles beyond the upper forks of the Neuse river in the southeast corner of Orange county, on Knapp of Reeds creek, on the farm of Mr. Joseph Woods. The ore-bed outcrops at one point for a few rods, where it appears to be about three feet thick, and has a strike N. 40° E., and dips at an angle of 70° to the northwest.

At Mt. Tirzah, in the southeast corner of Person, near the Orange line, there is a vein of hematite (specular), from which iron was made to some extent during the war. The vein is described as about six feet thick. The specimen sent to the Museum indicates a very fine ore, resembling that at Buckhorn.

The ores of Montgomery and Randolph belong properly (geologically) to the Chatham range; they are found in the same great slate belt (Huronian) that constitutes the most notable feature of the middle region of the State, both geologically and mineralogically. The best known of these ores is found near Franklinsville, Randolph county. And another vein has been opened near Ashboro, both of specular hematite. Some of the strongest and most highly prized iron obtained during the war came from this locality. It was all devoted to the manufacture of shafts and other machinery for the

steam rams (iron-clads) and the like. Dr. Emmons describes an occurrence of hematite of apparently considerable extent seven miles southwest of Troy, in Montgomery county; he says it is free from sulphur and a very pure ore. Another occurrence of ore—magnetite—is noted by him four miles north of Troy.

Iron Ores of Guilford County.—One of the most remarkable and persistent ranges of iron ore in the State crosses the county of Guilford in a northeast and southwest direction, passing about ten miles northwest of Greensboro, near Friendship. It extends from the head waters of Abbott's creek, in Davidson county, entirely across Guilford to Haw river, in Rockingham, a distance of some thirty miles, making its appearance on nearly every plantation, and indeed almost every hillside in the range. The ore is granular magnetite, and is everywhere titaniferous. There is a second, but much more interrupted, range of ore parallel to the one just described and lying a few miles to the northwest.

The length of the outcrop, air-line measure, is twenty-eight miles.

There is *another ore belt* running parallel with the former and at a distance of three miles from it. This is called the Highfield or Shaw outcrop. Beyond Haw river the two belts approach each other, and are believed to unite in Rockingham county. The ore-bed is full six feet across, solid ore—a very green, chloritic, mica slate, rock ore. In a run of eight hundred yards, there are *apparently two hundred thousand tons above water level*, in the

one six-foot bed. The out-crop runs along the top of a hill about one hundred feet above the bottom of Haw river valley.

Dr. Lesley mentions beds of ochre of various sizes, "as one of the constituent elements of the whole formation. The largest exhibition of ochre which I saw, is on the L. Somers plantation on Brushy creek. Here an ochre bed twenty feet thick rises, nearly vertical, out of a gully in a hillside covered with small pieces of fine, compact ore. The whole aspect of this place gives an impression of an abundance of ore beneath the surface, but no openings on the beds which have furnished these fragments have been made."

This Guilford range of ores has not been traced to its termination in either direction, and doubtless other valuable beds will be discovered; and there are already indications that there are outcrops of the same kind of ore as far northeast as Caswell county.

There are also other iron ore localities in Rockingham, which do not belong to this range; for example, near the Virginia line in a northeast direction from Madison; and again two miles below the mouth of Smith's river (Morehead's Factory), there is a bed of red hematite iron ore, about ten inches thick at the outcrop.

Iron Ores of Mecklenburg and Cabarrus.—No iron mines of any extent have been worked in these counties, but ore has been found in a number of localities. Some explorations have been made in the southern part of Mecklenburg at the same time, in the Sugar Creek

neighborhood. Numerous blocks of a remarkably pure granular magnetic ore were found scattered over several acres of surface of an old field, and along the public road; and several trenches were cut, which exposed two or three veins of one to three and four feet in thickness. Some twelve or fifteen miles north of Charlotte, in the Hopewell neighborhood, a very notable quantity of surface fragments of large size are found in an old field and skirt of woods adjacent. This is a specular ore in a gangue of quartzite, not unlike the Chapel Hill ore.

Iron Ores of Gaston, Lincoln and Catawba.—In these counties is one of the most extensive ore ranges in the State. The ores are predominantly magnetic, with a variable percentage of hematite. The direction of this range of ore-beds is coincident with the strike of the slates, and is about N. N. E. from King's mountain on the southern border of the State, to Anderson mountain, near the Catawba river, in Catawba county. To Mr. G. B. Hanna, who has lately made an examination of many of the beds for the Survey, I am indebted for several valuable observations. He states that for a considerable part of the range there are two parallel beds, the more westerly being generally the larger and more productive, their thickness running from four feet (and sometimes as low as two feet) to twelve; the interval of twelve to twenty feet between them being occupied by talcose and chloritic slates, with a little ore in layers. The ore has been generally mined in a very rude and wasteful fashion, the operations seldom penetrating be-

yond water-level, fifty or sixty feet, and generally limited to surface openings. The range naturally divides itself into two groups of beds, the northern and southern, the one lying mostly in Lincoln and the other in Gaston. The most considerable of the Lincoln beds and the one which has been longest and most extensively wrought is known as the *Big Ore Bank*. This is situated seven or eight miles north of the Carolina Central railroad, and, as is usual with the outcrops of these beds, is on a hill or broad ridge. There are several beds evident, but the scattered and partially filled openings do not furnish the means of arriving at a satisfactory notion of their exact relations. The quantity of ore, however, seems to be very great, the thickness of the beds at some places being estimated at about eighteen feet. Several furnaces and a number of forges have been supplied with ore from this point for a long period. Following the compass course of the out-crops, about N. 20° E., a succession of ore-beds is encountered at intervals of one or two miles, to the southeastern base of Anderson mountain—the Brevard ore bank, the Robinson ore bank, the Morrison ore bank, which last extends into Catawba county. The thickness of the beds is given by Mr. Hanna in the general statement quoted above, as ranging from four to twelve feet. The quality of iron manufactured from this range of ore beds has always been good; and all the furnaces on this part of the range were put in blast after the war, for the purpose of supplying a high grade charcoal iron for the northern market.

Limestone for fluxing is found convenient in the range of beds which accompanies these slates, one to two miles to the west from King's mountain to a point several miles beyond Anderson mountain.

A few miles northwest of the last named mountain is a bed of limonite five or six feet thick.

Several miles further, in a northwesterly course, seven miles southwest of Newton, there is a series of ore deposits known as the Forney Ore Bank, whose mineralogical character and geological relations are entirely different from those of the ore beds of Lincoln county. The ore is a remarkably pure magnetite, heavy, black, metallic and non-granular, for the most part. The iron manufactured from it in the forges of the neighborhood, particularly at Williams's, was in much request before and during the war, being very malleable, tough and strong. All the blooms which could be procured at the naval works in Charlotte during the war were used for the manufacture of shafts for iron-clads and bolts for the cannon of the coast forts.

At a point six or seven miles northeasterly from this, is the Barringer Ore Bank, which is some two miles southeast from Newton. This ore is of the same character and geological relationships as the last. The ore is of the best quality, and the distance from railroad is only about two miles.

There is also another deposit in Lincoln county which does not belong to the series of beds above described. It lies about two miles east of Lincolnton on the plank road,

and is traceable some hundreds of yards through the forests by the surface fragments, which are widely scattered. The ore is limonite.

The lower part of the great iron range under consideration is mostly found in the southern half of Gaston, as the upper was mainly limited to the northern part of Lincoln. These ore beds appear to constitute a double parallel range, the divisions much more widely separated than in Lincoln. The *Yellow Ridge Ore Bank*, on the most southerly outcrop, at the western base of King's mountain, seems to belong to the eastern division. The bed here, which has been extensively wrought, and was penetrated to a depth of one hundred and twenty feet, is reported by Mr. Hanna and others to be sixteen feet thick (occasionally forty), with a steep westerly dip. Hanna says of the ore: "It is notably magnetic, but more highly peroxidized than that class of 'gray ores' generally." At the western base of Crowder's mountain, in a northeasterly course, on this range, is the Fullenwider ore bed.

There are other beds or veins of iron ore on the east side of Crowder's mountain, one of which is about a mile distant, but no openings have been made here.

There are three notable ore beds on the western division of this part of the range, on the lands known as the "High Shoals." They are the *Ferguson*, the *Ellison* and the *Costner* ore banks. The first is the most southerly. It is a granular magnetic ore, with much iron pyrites, which has been superficially changed to limonite. This

bed has been long worked, but the sulphur has always lowered, more or less, the quality of the iron made from it. The Ellison ore bank is about a mile northeasterly on the range. This has been worked for a great while, and has furnished an immense amount of ore. Its quality is very high.

The *Costner Ore Bank* is about three miles in a northerly course, on the same line, and one mile east of the furnace ("Long Creek"). The rock is granitic and syenitic, and one wall is a bed of crystalline limestone, twelve feet thick. The ore is a very dense, metallic and sub-crystalline magnetite, and is very free from impurities, and the bar iron made from it is very tough and strong. The vein is ten to twelve feet thick, and it is reported by the miners who last penetrated it, at a depth of over one hundred feet, to be above twenty feet thick.

There are two other important ore beds on this tract, "High Shoals," but they do not belong to the regular range of ore beds which we have been considering, being out of their line to the west, and of a very different character. The ore nearest to the line of the deposits last described is the *Mountain Ore Bank*. The vein is four to eight feet thick, associated with a heavy quartz vein, in a quartzo-argillaceous slate, and has a strike N. 35° E., and which does not vary more than 1° to 5° from the vertical (towards the west). It is remarkably pure, and will no doubt become valuable in the manufacture of *spiegeleisen*. The second vein, the *Ormond Ore Bank*, is in the slate belt also, and is probably a

vein. The vein is reported to be eight to fifteen feet thick. This ore is manganiferous like the last, and is a hematite, which is partly hydrated and limonitic, (turgite?).

There are five furnaces on this range of ores.

Iron Ores of Yadkin, Surry and Stokes.—The ores of this region occupy a relation to the Pilot and Sauratown mountains, similar to that of the Gaston and Lincoln ores to the King's mountain range. They are found along the base and among the spurs and foothills of the range. And like them too, these deposits divide themselves into two groups, geographically, one in Stokes and the other in Surry and Yadkin. They are all magnetic and granular.

Another ore bed and two forges (Hyatt's), are found on the west side of Ararat river, near the mouth of Bull Run creek. A third ore bed, which has been worked for many years, known as Williams's, is four miles northwest of Rockford. The iron made from the ores of Surry has a good reputation in the region; they are apparently very pure. On the south side of the river, there is a series of ore beds running from the river in a southwesterly course to Deep creek, nearly across the county of Yadkin.

This range of ore beds extends southward across the South Fork of Yadkin river into Davie county, where the ore still preserves the same characteristics as in the above mentioned counties. One, the Rogers ore bank, is eight feet thick, and has been worked on a considera-

ble scale; and an excellent iron was smelted in the furnace at Danbury during the war. Another bed reported to be ten feet thick has been opened about half a mile east of the last, and two beds (one of them four feet thick, the other not opened), have been discovered at different times within three hundred and six hundred yards of it, on the west. The ores are all magnetites, with sometimes a small admixture of hematite.

The purity of these ores is conspicuous. Phosphorus is wholly wanting. Some samples contain a small percentage of pyrites. Manganese appears as only a *trace* in the analyses, but it must exist in larger proportions in some parts of the bed, as *spiegeleisen* is occasionally an accidental product: There are other outcrops of magnetic ore in the county, a notable one on the south side of the Sauratown mountains, among the head waters of Town Fork of Dan river.

Iron Ores of Burke, Caldwell, &c.—There are many valuable beds of limonite in a range extending in a northeast direction from the northeastern foothills of the South mountains into the Brushy mountains, from Jacob's Fork of Catawba river, near the eastern border of Burke, across the Catawba, and by way of Gunpowder creek, to the waters of Middle Little river near the eastern border of Caldwell; and beyond, near Rocky creek, in Alexander, and even on the northern slopes of the Brushy mountains in Wilkes, the same ores occur, being undistinguishable in appearance, and of identical lithological relations.

There is a bed near the town of Hickory, reported to be five or six feet thick; and three miles west at Propst's are a number of pits from which a quantity of ore was obtained during the war; and at the distance of six miles, on the lands of Mrs. Townsend, a bed was opened some thirty years ago, and the ore, in considerable quantities, smelted in the Shuford furnace in the neighborhood.

Iron was also made on Gunpowder creek, Caldwell county, thirty or forty years ago, from a similar series of limonite beds. The quantity of ore is reported as large. The beds on Middle Little river, twelve miles southeast of Lenoir, were worked nearly fifty years ago, and the ore hauled seven miles to Beard's furnace, on the Catawba river. The outcrops are traceable on the slopes of McIntyre's mountain and Bald mountain, near Mr. White's, on Miry branch, for a distance of two to three miles, the outcrop on the former being about three or four feet, and on the latter eight or ten; and it is reported that at some points the thickness is more than double the above figures. There is every surface evidence of abundance of ore. Being a mountainous region, timber for fuel is abundant, and water-power also.

A bed of superior magnetic ore occurs on Warrior creek, not far from Patterson, Caldwell county, and within a mile of the bend of the Yadkin river. It is traceable hundreds of yards by large surface fragments of a fine grained, heavy, metallic ore, remarkably free from rocky admixtures; and a similar ore is reported as

occurring in large mass a few miles west on Mulberry creek. Another very fine ore, a shining metallic, slaty hematite, of great purity, is found a few miles above on the spurs of the Blue Ridge, flanking the Yadkin river, in a cove known as Richlands.

In the same neighborhood, on the farm of Mr. J. Curtis, on the banks of the Yadkin river, seven or eight miles above Patterson, is a heavy ledge of titaniferous iron ore. The exposure is not less than twelve to fifteen feet thick, and the surface is covered with heaps of angular fragments of all sizes, up to a hundred pounds or more.

Some ten or twelve miles northeast of this point, on the flanks of the Blue Ridge, near Cook's Gap, in the edge of Watauga county, occurs another outcrop of the specular (martite) schist of Richlands. The bed at this locality, which is called Bull Ruffin, is reported to be three or four feet thick at the outcrop.

In McDowell county there are several beds of limonite. These are mostly aggregated along the top of Linville mountain, southern part, and the western slope, near the foot, and in the spurs of the southern end. These Linville limonites made an inferior iron when worked alone, but mixed with the magnetite and hematites of the region, they would become available for the manufacture of good metal.

The limestone beds of the same belt, in North Cove and along the flanks of Linville, are conveniently located for furnishing a flux, and the forests of these mountains will furnish indefinite quantities of fuel.

Ore mountain, one mile west of Swannanoa Gap (and therefore just over the Buncombe line), is named from the occurrence on its flanks of a bed of limonite, which doubtless belongs to the iron ore range of Linville. The bed is not well exposed, but three or four feet of thickness are visible on the steep escarpment, and large masses which have broken off are fallen down to a lower point on the slope.

Iron Ores of Mitchell and Ashe.—In Mitchell county is found one of the most remarkable iron ore deposits in North America. It lies on the western slope of the Iron mountain (a part of the Great Smoky range), in the northwest corner of the county, three miles from the Tennessee line, and about a mile from the rapid torrent of Elk river, the principal affluent of the Watauga. It has been long known as the Cranberry ore bank, from Cranberry creek, which flows at the foot of the steep mountain spurs, on which it outcrops.

The ore is a pure magnetite, massive and generally coarse granular, and exhibits strong polarity. The length of the outcrop is about fifteen hundred feet, and the breadth two to eight hundred.

The softness and toughness of this iron is very remarkable, and its tensile strength, as tested by the United States Ordnance Department, ranks with that of the best irons known. The blooms from the Cranberry forges have been extensively used in Baltimore for boiler iron, and commanded fifteen dollars a ton above the market. In quality it is unsurpassed by any

iron in the world. And in regard to quantity, the bed much exceeds the great deposits of Missouri and Michigan, and at least equals anything in the Champlain region. So that it has not probably an equal in this country.

There are other magnetic ore beds in the neighborhood of less extent. One is said to occur along the face of the same (Iron) mountain between one and two miles eastward; and several others at the distance of six to ten miles in a southeast direction. Northwestward also, beyond the State line and within a few miles of it, is a number of ore beds, mostly magnetic—one limonite; indeed it is evident that there is an extensive range of iron ores in this region which are of the highest quality, and must one day attract a large capital for their development. Deposits of ore are also found in other parts of the county; but like the last named, they are known only by their out-crops. One of these is a bed of magnetite, on the lower slope of Little Yellow mountain, at Flat Rock. The ore is quite like the Cranberry, of equal purity apparently, and strongly polaric. Some large blocks are found on the surface, weighing several hundred pounds.

A bed of limonite occurs three or four miles northwest of Flat Rock, recognizable by a profusion of surface fragments, but no explorations have been made. On Rock creek, beyond Bakersville, at the foot of the great Roan mountain, are also several beds of magnetic ore, of which hand specimens resemble the Cranberry

ore, and the geological associations are also the same. Of the size of the beds I have no definite information.

In Ashe county, in the northwest corner of the State, there are some important ore deposits, on the waters of North Fork or New river. They lie chiefly north and northeast of Jefferson, on Horse creek and Helton creek.

On Helton, six or eight miles east of the last, are still larger deposits of very pure magnetic ore, which has been long used in the forges of the neighborhood. The ore is a coarse grained and very pure magnetite, one of the beds of which is reported to be eighteen feet in thickness and another nine feet. This is manifestly an iron region, and worthy of a thorough investigation.

Iron Ores of the French Broad.—There are several localities on the western slopes of the Black mountain, on the head waters of Ivy, in the eastern edge of Madison, where magnetite is found in considerable surface masses, though no explorations have been made. A bed also of titaniferous iron occurs here near the public road, and about midway between Asheville and Burnsville.

On Bear creek below Marshall, near the French Broad, there are surface fragments of magnetite in hornblende slate, but no vein or bed has been exposed. On the eastern Fork of Big Laurel there is a large outcrop of a slaty granular magnetite at Mrs. Norton's, and near Jewel Hill a bed or vein of specular hematite in a reddish felspathic gneiss, the ore said to be abundant.

About five miles west of Asheville a bed of limonite of several feet thickness has been opened.

In Haywood county, there is a larger massive outcrop of granular magnetite; it is in the northeastern part of the county, on Wilkins's creek. The bed is no doubt large from the boldness of the outcrop, which projects in large masses above the surface.

There are also magnetites and hematites in various localities of Jackson and Macon counties, some of which are represented in the Museum by very fine specimens, and the deposits are reported to be extensive, but as no iron has been made in those counties, there has been no occasion for their development.

Iron Ores of Cherokee.—There is no other county in the State which contains so much iron ore as Cherokee. It is all, however, of one species—limonite. The marble beds of Valley river and Nolteley river are everywhere accompanied by beds of this ore. The breadth of this iron and marble range is two to more than three miles.

About one mile north of Murphy the quartzite forms a high ridge, having two beds of limonite, one on either flank, that on the northwest very fine and twenty-five feet thick.

At one-half mile below Murphy there seem to be four limonite beds with a small outcrop of the quartzite, the marble occupying the middle term of the section.

These beds of ore are traceable northwards to within two miles of the Valley River beds, near Mrs. Hayes's.

The quantity of ore in this county is therefore immense, and is very widely distributed, and the forests of the mountain slopes furnish unlimited supplies of fuel, while the marble is at hand everywhere for fluxing.

Spathic ore (siderite) is found in many of the mines of Cabarrus, Rowan and Davidson, and in some of them in large quantities. At the Cosby mine, in Cabarrus, an immense heap of it has been thrown out in mining for copper, and it is contaminated by the presence of copper pyrites.—*Condensed from Kerr's Geology of North Carolina.*

Coal.

The coalfields of North Carolina are referred by Dr. Emmons and Prof. Kerr to the triassic system.

There are, says the latter, in this State two narrow fringes of an eroded and obliterated anticlinal, which belong to this system; the smaller, or Dan river belt, from two to four miles wide, following the trough-like valley of that stream (about N. 65° E.), for more than thirty miles, to the Virginia line; the other, the Deep river belt, extending, in a similar trough, five to fifteen miles wide (and depressed 100 to 200 feet below the general level of the country), from the southern boundary of the State, in Anson county, in a N. E. direction

to the middle of Granville county, within fifteen miles of the Virginia line.

The most important and conspicuous member of the series is a large body of black shales, which encloses seams of bituminous coal, two to six feet. This coal lies near the base of the system in both belts, and is underlaid on Dan river by shales, and on Deep river by sandstones and conglomerates; the latter constituting the lowest member of the series, and being in places very coarse.

The black shales near the base of the system contain beds of fire clay and black band iron ore, interstratified with the coal.

Emmons reports, in the Deep river coalfield, five seams of coal, separated by black slates, shales, black band iron ore and fire clay; and, in general, he finds a remarkable similarity to the coal deposits of the carboniferous formation.

The coal with its shales outcrops along the northern margin of the belt at various points, for more than fifteen miles, and many shafts having been sunk to and through the main seam, which is the upper one, it is ascertained to be very persistent in all its characteristics and associated beds.

The area of this coalfield is given by Emmons as about 300 square miles. The quality of the coal is also discussed by him and by Admiral Wilkes, and various analyses are published; the three following by the latter, of samples from different parts of the field:

Carbon	60.7	59.25	84.56
Volatile matter	32.7	30.50	7.42
Ash	5.3	10.21	7.80
Sulphur.....	1.3	.....	.....
	<hr/> 100.0	<hr/> 99.99	<hr/> 99.87
Specific gravity.....	1.28	1.41	1.49

The first analysis (by Schæffer) represents the coal at the Egypt shaft, the second, by Prof. Johnson, the outcrop at Farmville, and the third, by the same, the Wilcox seam. Wilkes says, in his report to the United States government: "The three upper seams of the bituminous coal are well adapted for fuel, cooking, gas and oil. It is a shining and clear coal, resembling the best specimens of Cumberland. It ignites easily and burns with a bright, clear combustion, and leaves a very little purplish gray ash. It swells and agglutinates, making a hollow fire." "It yields a shining and very porous coke, and is an excellent coal for making gas or for burning." "The dry or debituminized coal" exists in "but small quantities in the basin," and "contains less than one quarter of the volatile matter that the bituminous coal contains."

In regard to the value of the Chatham coal for gas making, the reports of the superintendents of the gas works of Norfolk and Portsmouth are highly favorable, "both as to the quality of the gas produced and the quantity which a given amount of coal yielded."

It is worth while to mention here also the *bituminous shales*, which show themselves in so strong force above

the coal in the Egypt section. Dr. Emmons estimated the thickness of the oil-bearing strata at seventy feet, and pronounced them capable of yielding thirty per cent. of their weight in kerosene oil. So that here is an inexhaustible resource for fuel, over and above that furnished by the coal seams.

The following extract is from the report of Dr. H. M. Chance on the exploration of the Deep river coal-field, made by order of the Board of Agriculture during the years 1884-'85:

"This formation is divided into an upper and lower series by the addition of a middle member composed of dark slates and gray sandstones carrying beds of coal, black-band, fire-clay, layers and balls of carbonate of iron, impure limestone, and beds of highly bituminous or carbonaceous slate and shale."

WORKABLE AREA.

"The most promising area is that extending from Farmville on the east to the Tysor (adjoining the Gulf) place on the west.

"The length of the outcrop included between these limits is between four and five miles. Under the most favorable conditions we are not warranted in assuming the thickness of workable coal at more than five feet—three feet for the upper and two feet for the lower bed. If the dip of the coal continues as found at Egypt (423 feet in 1,500 feet) over the whole area, the coal could probably be worked to a vertical depth of, say 1,100

feet, which places the limit along a line parallel to the outcrop and about three-quarters of a mile distant from it. Assuming the length of the outcrop at four and a half miles, the area is then 2,160 acres. If 2,500 tons per acre could be mined from the lower bed and 4,000 tons from the upper bed, we have for the available tonnage:

Upper, or "Big" bed.....	8,640,000 tons.
Lower, or "Little" bed.....	5,400,000 "
Total	<u>14,040,000 tons.</u>

"This is the most favorable showing that can be made, and is doubtless far in excess of the actual workable contents of this area, for no allowances have been made for those areas ruined by trapdykes, and for areas in which the coal is thin or even absent, nor for areas over which the coal is faulted or is too impure to ship. I believe that these irregularities will reduce the area by at least one-half, or say 1,100 acres. It will also be safer to estimate the yield of the lower bed at 2,000 tons and the upper bed at 3,500 tons per acre. The available tonnage so calculated would then be:

Upper, or "Big" bed.....	3,850,000 tons.
Lower, or "Little" bed.....	<u>2,200,000 "</u>
Total	6,050,000 tons.

"Even if this calculation is still too large, and we cut it down to one-half (3,000,000 tons), the amount is suf-

ficient to sustain a daily output of 500 tons for twenty years. If this coal cost the consumer only fifty cents per ton less than other coal, the resulting economy would amount to one and a half million dollars (\$1,500,000) saved to manufacturers and other consumers throughout the State. In addition to this, probably a much larger amount would be saved by reason of the reduction in price of other coals, resulting from competition. In addition to these benefits, the profits made by the operators, the railroads transporting it, and the employment afforded a large number of miners and laborers, should not be underestimated.

“Again, three million tons of coal, at an average price of \$3.50 per ton, cost over ten million dollars (\$10,500,000). If this amount of money can thus be kept in the State, instead of being paid out to the owners of mines in other States, the commercial value of this coalfield to the State can hardly be overestimated.”

On Dan river the coal first shows itself, says Prof. Kerr, on the surface about three miles east of German-ton, being imperfectly exposed in a ravine. The coal is about three feet thick. Some six to seven miles further east, at Stokesburg, there are outcrops of three seams in succession, the upper about three feet thick, with a heavy body of bituminous shales; the other two were not well enough exposed for measurement, but they were explored by a very intelligent gentleman who reports one of them as much thicker than the top seam. The black shales and slates crop out at

various points about the town of Madison, and near Leaksville a slope was driven some sixty feet on the coal seam which is here three feet thick, and with a dip of 34° , and considerable quantities were mined during the war. It is classed as a semi-bituminous or dry coal. The outcrops show that the coal is continuous through the whole length of the belt in this State, which is about thirty miles.

The report of Dr. Chance on the *Dan river* coal differs widely from the above in respect to the extent, quantity and quality of the coal there. It is not likely that these points will be definitely settled until another exploration is made.

Gold.

The gold of North Carolina, says Dr. Emmons, belongs to four different geological positions: 1. The loose quartz grit beneath the surface soil; 2. In stratified layers, which are cotemporaneous with the rock; 3. In connection with seams and joints of the rocks, and probably also diffused in the mass; 4. In regular veins associated with quartz, and the sulphurets of iron and copper.

The principal counties in which it has been found in sufficient quantity for exploitation are, Dr. Genth says, Franklin, Nash, Granville, Alamance, Chatham, Moore,

Guilford, Davidson, Randolph, Montgomery, Stanly, Union, Cabarrus, Rowan, Mecklenburg, Lincoln, Gaston, Catawba, Caldwell, Burke, McDowell, Rutherford, Polk, Cleveland, Cherokee, Jackson, Transylvania and Watauga.

It is generally more or less alloyed with silver, varying from pure gold on the one side to pure silver on the other. Near the surface it is usually associated with limonite, and at a greater depth of the deposits with pyrite, chalcopyrite, galenite, zincblende, tetradymite, arsenopyrite, rarely with altaite and nagyagite.

Copper.

Dr. Genth, the eminent mineralogist, says in regard to copper ores :

“Copper ores have been found in many localities throughout the State, in the veins of the old gneissoid rocks, as well as in the more recent slates, and even in the triassic formation.

“The principal ore is chalcopyrite or copper pyrites ; and there is every reason to believe that many of the mines require only a fuller development to enable them to furnish large quantities of valuable ores.

“Many of the gold veins are associated with pyritic ores, and in fact almost all the North Carolina copper mines in the central counties have first been worked for gold, and there are hardly any mines in Guilford, Ca-

barrus and Mecklenburg counties occurring in the gneissoid and syenitic rocks which do not show strong indications of copper ores.

“The general character of these mines is that about at water level, the so-called brown gold ores are replaced by quartz richly charged with iron pyrites more or less mixed with copper pyrites, the latter increasing as the mine deepens, and in many places becoming the only or the predominating ore, and forming a regular copper vein.

“The ores either became poor in gold or the latter could not be extracted by the ordinary process, then chiefly in use in North Carolina—Chilian mills and arrastras—therefore many valuable mines were abandoned, mostly before a larger and paying quantity of copper ores had been reached.

“The principal mines which promised to change into copper mines are in Guilford county, the Fisher Hill, the North Carolina, the McCulloch, Lindsay, Gardner Hill, Twin Mines, etc.; in Cabarrus county, the Ludowick, Boger, Hill, Phoenix, Orchard, Vanderburg, Pioneer Mills, etc., and in Mecklenburg, the McGinn, Hopewell, Rudisill, Cathay Mines, etc.

“The cupreous minerals observed in the mines are, near the surface, small quantities of native copper and cuprite, the latter sometimes in beautiful needles, the so-called chalcotrichite, malachite, rarely azurite, chrysocolla and pseudo-malachite, and in some of the mines chalcocite and barnhardtite; all resulting from the decom-

position of chalcopyrite or copper pyrites, which forms the principal ore. Siderite or carbonate of iron often forms an important gangue rock."

There are, says Emmons, several veins of copper ore in the northeast part of Person county. At the Gillis mine the metal which the vein carries is known as the vitreous copper ore, which yields, when properly dressed, about sixty per cent. of copper. Two shafts have been sunk upon the vein; in the south shaft it is eighteen inches, in the north about five feet. The vein carries in addition to the vitreous copper, silicate of copper, green carbonate, red and black oxides of copper, the latter rare. Dr. Emmons expressed the opinion that this part of Person and the adjoining part of Granville would prove a mineral district of considerable importance.

Silver, Lead, Zinc.

From Dr. Genth's Report :—

"I shall consider these three metals under one head, as they are always associated.

"Silver is a rare metal in North Carolina. With the exception of the silver alloyed with gold, varying from one or two to about twenty per cent., in the gold from veins and gravel deposits of the granitic and gneissoid rocks, very little silver has been found in the veins of these strata.

“The only real silver mines of North Carolina are ore beds of zincblende, mixed with galenite, in the argillaceous and talcose slates. The type of these is the old Washington mine, now Silver Hill, in Davidson county, which was discovered in 1838. Near the surface is formed a bed of carbonate of lead, having in many places films and plates of metallic silver disseminated throughout the mass of the ore. These ores were easily reduced, and produced handsome returns to the owners. This was, however, but of short duration. The undecomposed ores, which were a very fine grained mixture of brown zincblende and argentiferous galenite, were soon reached, and presented great difficulties in the extraction of the precious metals.”

Recently, says Prof. Kerr, they have been discovered in several of the western counties.

Other Useful Minerals.

MICA.

A great many mines of this mineral have been opened in the last twelve years in some of the western counties of the State, in the archæan rocks. It is found in ledges (veins) of very coarse granite. Many of the plates of mica are of remarkable size, reaching three and even four feet in diameter. It is used chiefly in the manufacture of stoves, and the mining of it is a very profitable and rapidly growing industry.

Mica mining has been carried on most extensively in Mitchell, Yancey, and Macon counties; in Jackson, Haywood and Buncombe, &c., to a less extent. One mine in Mitchell yields a ton of marketable mica a month; and this region furnishes the bulk of this mineral to the world's markets. The aggregate product of these mines has been over 250,000 pounds, worth about half a million dollars.

CORUNDUM

Has been found in large quantities in several counties west of the Blue Ridge, and is now extensively mined. Several valuable rubies and sapphires have been obtained, among them a crystal of 312 pounds, which is in the cabinet of Amherst College, Massachusetts.

The principal use of this mineral is in the manufacture of the finer kinds of emery, for which purpose it has no equal.

CHROMIC IRON.

Small quantities of chrome are found associated with some of the iron ores of the State, the lead which crosses Guilford county for example. But it is also found as chromic iron, in coarsely crystalline masses, often of considerable size and in the form of very irregular veins, or pockets, in the chrysolite beds of Jackson, Yancey, Mitchell and Watauga counties. The most considerable deposits are two, one near Webster, and the other five miles from Burnsville, on Jack's creek, at Hampton's.

MANGANESE.

From Dr. Genth's Report:

"Pyrolusite, psilomelane and wad are found in small quantities in many places in this State, but nowhere in abundance, so far as known. They are generally associated with iron, gold and silver ores. There is a very promising vein, or bed of psilomelane in Caldwell county, five miles west of Lenoir. It is found in irregular and rounded masses imbedded in light colored gneissic slates, some of the masses being ten, fifteen and twenty inches thick, and occupying a breadth of three or four feet of the strata. There is also a small seam in the town of Danbury, Stokes county, and laminated masses of one-half to one inch thick occur in the Buckhorn iron ore beds, and there are hand specimens in the Museum from Nash county and several other points.

"Manganese is found associated with the iron ores in various parts of the State. At Buckhorn it is found as a silicate and probably in the form of knebelite. Beds of manganese garnet are of common occurrence and often of great thickness. There is a series of such beds associated with the King's mountain slates of Gaston, Lincoln and Catawba, which are superficially changed to black oxide."

Several veins of the black oxide, of considerable extent, says Prof. Kerr, in a recent report, have been found.

KAOLIN,

Says Prof. Kerr, "is found abundantly almost from one end of the State to the other, from Edgecombe and

Robeson to Macon; valuable for china and other wares, for paper making and for firebrick. A curious fact may be mentioned here which I came upon recently, that the first mineral export from North Carolina, if not from America, more than two hundred years ago, was kaolin, from the mica mines of Mitchell to Macon; for it happened that at that time all Europe was wild in the search for the earth out of which china ware was fabricated, the Asiatics and Asiatic traders having carefully concealed their art from the outside barbarians of Europe. This mineral, therefore, bore a high value; and there is none better found in Europe to-day than that which the Indians "packed" from the Smoky mountains to the coast, under the name Unakeh, their name for the Smokies (meaning white), still called, in places, Unaka in Mitchell, and Unakoi in Cherokee. These Indians were not miners, but this kaolin or white earth had been exposed like snow banks in huge dumps and open cuts by an ancient mining people, the Mound Builders, a thousand or two years ago, who obtained here the mica which is found so abundantly among the remains of those people, all over the Northwest to the great lakes."

One of the largest beds of kaolin is found near Greensboro, a few miles south.

FIRE CLAY.

The vast tertiary and quaternary tracts of the eastern section, says Prof. Kerr, abound in beds of potter's clay, fire clay, &c.

Dr. Emmons, in his report, refers particularly to one locality. He says: Clay for fire brick is abundant in Gaston county. It is free, I believe, entirely from lime and the alkalies, potash and soda. It extends through the county. It is inexhaustible in the vicinity of King's mountain, and appears at numerous places between the Ironworks and Dallas, as well as at numerous places in and about the latter place.

AGALMATOLITE

Is found in the southwest corner of Chatham. This is a large deposit belonging to the Huronian series, which has a quite extensive range: occurring in Montgomery and parts of Chatham. It is popularly called soapstone, and has the soapy feel of that mineral, but contains only 3.02 per cent. of magnesia. This substance has been an article of trade to New York, on a large scale and for many years. It is used in the manufacture of paper—wall paper especially—soaps, cosmetics, pencils, &c., and for various adulterations.

WHETSTONE.

Among the silicious argillytes so abundant in the Huronian strata, there are frequent beds of novaculite or whetstone. One of the best localities is a few miles west of Chapel Hill, from which these stones have been carried in all directions. Other quarries are found in Person county, near Roxboro, in Anson, not far from Wadesboro, in Montgomery and adjoining counties, on the great Huronian belt, and in fact almost every section

of the State has its own quarries, which either do or might supply the local demand, at least in part, and as to articles of the commoner grades.

MILLSTONE AND GRINDSTONE GRITS, &C.

The sandstone of the State is, in many places, well adapted to the purposes of grindstones, and during the war, while the foreign supply was cut off, they were largely so used. The Anson county quarries furnish a very fine grindstone and whetstone grit.

The conglomerates of the triassic series, which are associated with and replace the sandstones above mentioned, have been long and widely used for millstones. They have been principally obtained from Moore county, on McLennan's creek, where they are obtained of excellent quality; and they have been distributed from this point over a large number of the intervening counties, to the Blue Ridge. Some of these stones have been in use for fifty years; and they are occasionally found to be nearly equal to the French buhr-stone.

The coarse porphyroidal granites and gneisses which are scattered over so large a part of the State are, however, the most common material for mill stones. And in the eastern section the shell rock is often partly or wholly silicified, forming a sort of buhr-stone, as in Georgia, and is well adapted to the same uses. In Madison county, in the Huronian slates in Laurel river, there is an irregularly laminated whitish quartz, occurring in large veins, which is used for millstones, which are reported to be a good substitute for buhr-stone.

GRAPHITE.

This mineral is quite widely distributed in North Carolina, both in the Huronian and Laurentian formations. There are very fine hand specimens in the Museum from a number of counties, Person, Yancey, Catawba, Cleveland, Burke and others; and there are beds of a more or less impure, slaty and earthy variety, in several sections of the State, the principal of which are two: one in Gaston, Lincoln and Catawba, as a constant associate of the argillaceous and talcose slates and shales which belong to the King's mountain slates; and the other in Wake county. The former may be seen at various points crossing the public roads and cropping out in the gullies. At Sigmond's not far from Catawba station, in Catawba county, the bed was opened many years ago, and several barrels mined; and within the last year or two a considerable amount of trenching and exploration has been made, and several parallel beds are reported, three feet and more in thickness. In Cleveland county there are several outcrops also, of a thin seam of a few inches; one of them is near McBrier's Spring.

But the Wake county beds are the most extensive, as well as the best known graphite beds in the State. They extend in a northeast and southwest direction for a distance of sixteen or eighteen miles, passing two and a half miles west of Raleigh. There are two beds apparently, forming a sharp anticlinal. The thickness is two to three, and occasionally four feet. The eastern (and

longitudinally the most extensive) bed is nearly vertical, dipping sometimes east, but mostly west, at an angle of 70° to 90° ; it was opened at a number of points many years ago, and is wrought to considerable extent at present. It is a bed of quartzitic and talco-argillaceous slates, which are more or less graphitic—from about twenty or thirty to sixty per cent.

A large bed of a similar character is reported from Alleghany county, and a sample sent, which shows 12.38 per cent. of graphite.

Many of the Archæan gneisses of the middle and western regions of the State contain graphite, along with or replacing the mica.

LIMESTONE.

From Mitchell's Geology:

Limestone has been discovered at three points in the primitive rocks in Stokes county; at one on the bank of the Yadkin, three miles below Rockford, in Surry, and at several places in the southeastern part of Buncombe and Henderson. Small nodules and masses also have been found about Lincolnton, encouraging a further search, in the hope that larger bodies may be discovered. The limestone of King's mountain is in a small tract of later primitive, bearing an intimate resemblance to the country around Charlotte, and like that rich in veins of gold.

We have at some points a simple accumulation of shells, forming a good limestone sufficiently pure for all the common purposes of building, and of which it

might be expected that it would supply a large extent of country with quicklime. Such is that nine miles below Waynesboro, in the northwest corner of Jones, in the northern part of Onslow, at Wilmington, and on the northwest branch of the Cape Fear to the distance of forty miles above.

Small nodules of *compact* limestone, and masses of loose texture are found in the upper part of Wake, in Anson, and elsewhere.

Says Prof. Kerr :

This mineral is not as abundant in North Carolina as in many States, constituting, as has been seen, but an insignificant proportion of the mass of its rocky strata. And yet its distribution is such, and such are its relations to existing and abundant means of transportation, that it is accessible to the greater portion of the State. That part of the eastern region south of the Neuse river is abundantly supplied with Eocene or shell limestone, and to the northern half of that section both this source of supply is open, and the oyster shell heaps of the sounds and bays round to Norfolk.

The middle region of the State lies under the disadvantage of being dependent on railroad transportation for this most important agricultural necessity, and its source of supply is chiefly the same as for the east, together with the two narrow limestone belts, the one extending from Gaston to Stokes (the outcrops being intermitted between the Catawba and Yadkin), and the other lying wholly in McDowell county, so far as it

appears this side of the Blue Ridge, and along the upper valley of the French Broad, beyond that range.

MARBLE.

As elsewhere stated, there are several ranges of beds of crystalline limestone in the middle and western regions. The first belonging to the King's mountain belt, contains so far as yet known, very little marble that may be considered available for the purposes of ornamental architecture, or regarded as better than other common building stones. In the extreme west, however, in Macon and Cherokee, the limestone range, both on Nantehaleh and Valley rivers, contains beds of very fine marble of various colors, white, pink (or flesh colored), black, gray, drab and mottled. It is capable of a very fine polish, and will one day (when the difficulties of transportation shall be overcome) acquire a high value in architecture, as well as in other ornamental arts. In this last connection some of the *serpentine* beds may be mentioned as likely to come into use, and so to acquire a market value.

TALC.

From Dr. Genth's Report:

Foliated talc, of a white or greenish white color, is found in many of the chrysolite beds, west of the Blue Ridge, at Shooting Creek, Clay county, Franklin, Macon county, Webster, Jackson county, Hampton, Mining Creek, Yancey county, Bakersville, Mitchell county, and other localities; in sheets of three-quarters to one

inch in thickness and of a somewhat columnar structure, near Pilot mountain, Surry county; fibrous talc, with silky lustre, and of a white or green color, also compact, crystalline white talc, with a splintery structure on Valley river, Cherokee county, and also in Macon county. Talc slate and coarse soapstone are found in many localities throughout the State.

SERPENTINE.

Dr. Olmsted, in his report, in speaking of the magnesian minerals of Wake county, says: "Serpentine, though not strictly marble, is sometimes sawn into slabs and polished and sold under the name of green marble. It is by no means an uncommon mineral, but is not often found so beautiful as at the foregoing locality." The locality referred to is a little north of the black lead formation, and within twelve miles of Raleigh.

Dr. Genth says that "the massive are found in many localities. The best appears to come from the neighborhood of Patterson, Caldwell county. It has a dark greenish black color and contains fine veins of the yellowish green fibrous and silky *chrysolite*, and admits of a fine polish; greenish gray massive serpentine, also with seams of greenish and grayish white *chrysolite*, is found in the Baker mine, in Caldwell county, at which place is also found the variety *picrolite*. Dark green serpentine, has been observed in the neighborhood of Asheville, in Forsyth and Wake counties. A grayish or yellowish green serpentine occurs in the *chrysolite* beds of

Macon, Jackson, Yancey, Mitchell and other counties. It results from the decomposition of the chrysolite.

BARYTE.

In Prof. Olmsted's report is found the following notice of the vein found in Orange county: "On the farm of Mr. Latta, three miles south of Hillsboro, is a fine vein of a mineral called sulphate of barytes, or heavy spar. This substance is not very uncommon, but it is rare to meet with it of such purity and elegance as at this place. It is beautifully white and shining. It enters, as an ingredient, into the finest kinds of porcelain ware; it is used in certain chemical preparations, and is employed by the painter in forming certain water colors.

The following general notice is from Dr. Genth's report: "Baryte is found in small white tabular crystals, with pyromorphite and manganese ores at the McMakin mine, Cabarrus county. The laminated and coarsely granular white variety at the Cosby mine, and Orchard vein, in Cabarrus county; a vein of the coarsely laminated, grayish, white baryte, at the Latta mine, near Hillsboro, Orange county. It occurs coarsely granular, and has the appearance of white marble, at Col. Walk-up's, Union county. A vein of very white compact and granular baryte, of from seven to eight feet in width, has been found at Crowder's mountain; west of the Blue Ridge, a vein eight feet in width, of the white granular variety, exists at Chandler's, nine miles below

Marshall, in Madison county, where it is white and grayish white, and of a granular structure, with small patches of laminated baryte, and again on Elkin Creek, Wilkes county."

MARLS.

Marl is very abundant in twenty-five counties in North Carolina, very widely distributed, and of several kinds, the principal of which are four, viz.: Green-sand, Eocene, Miocene and Triassic. The former has generally but a small percentage of carbonate of lime, 5 to 30; the second usually 40 to 95; the third, 20 to 60; and the fourth generally less than 50. The last is of little consequence as a fertilizer, because of the very limited extent of its outcrops, and it is scarcely used where abundant. These marls are more extensively exposed than elsewhere in the northwestern part of Wake county and in the edge of Orange, between Morrisville and Durham. There are frequent outcrops of a bed of marl and impure limestone, two to four feet thick, over a territory of fifteen or twenty square miles, the nearly horizontal strata coming to the surface in ravines and gullies, and exposed in ditches, wells, &c. Near Brassfield turnout, on Mr. W. Rochell's place, is an exposure of nearly four feet of alternate thin beds of compact, light gray and red arenaceous limestone, with strata of uncompacted brick-red, marly clay between. The upper indurated strata contain more than 90 per cent. of carbonate of lime, and the lower about 60 per cent., and both require to be burned before they are available for agricultural uses.

Green-sand Marl.—occurs throughout the southeastern region of the State between the Neuse river and the Cape Fear. It comes to the surface, as stated, along the banks of the Cape Fear and Livingston's creek, on Black river, and South river, on the Neuse river and its tributaries about and below Kinston, along the Contentnea, and Moccasin, and at a few points even as far north as the Tar river.

Eocene Marl.—The marls of the next formation, which are always found overlying the preceding, when the two occur together, are either a calcareous sand, passing in places into a friable sandstone, coarse or fine, or a fine calcareous clay, or a conglomerate shell limestone, more or less compacted and occasionally semicrystalline. They are composed of comminuted shells, corals and other marine exuviae. A number of samples of these marls, representative of the Cape Fear region, have been analyzed and found to possess a chemical constitution not different from ordinary limestones, the percentage of carbonate of lime ranging from about 90 to 95.

Miocene Marl.—These are commonly known as shell marls or blue marls. They are found in limited patches or "beds," and are scattered over a much wider territory than either of the preceding, and being nearer the surface, and so, more accessible, have been much more extensively used, and are consequently much better known. They are found throughout a large part of the eastern region, from South Carolina to Virginia; in fact, they occur in all the counties of eastern North Carolina, ex-

cept those lying between, and north of the great sounds, and two or three small outcrops have been observed in Chowan, and in the northern part of Currituck. The western boundary of these beds is very nearly represented by a line parallel to and three or four miles west of the Wilmington and Weldon railroad, from Halifax to Goldsboro. Southward, the inland boundary is found to be generally but little west of a line connecting the latter point and Lumberton, that is, a line parallel to the coast and about sixty-five miles distant from it.

The area included within the above limits is about one-fourth of the State—a much larger territory than the whole State of Massachusetts, or New Jersey. These marls are valuable not only for the lime they contain, they have also various other valuable ingredients.

The question is often asked whether there are any minerals in the eastern section of the State; the answer is, the mineral wealth of that section, in the form of marl, is worth ten fold more than that of all the rest of the State beside, great and various as that is. If the money spent in gold getting alone, which is not less than twelve or fifteen millions since 1820, had been spent in marl getting, the State would be worth more than double its present aggregate valuation. For at the rate already given, that sum would have marled three millions of acres—more than the total surface now in cultivation; that is it would have produced a result at least equal to the adequate marling (at the rate of ten tons to the acre) of every acre now in cultivation, leaving out of

the calculation the interest, that is, the results of the increased production during several decades of years.

PEAT AND MUCK.

Peat and muck abound in the eastern portion of this State, and are so widely distributed that a large proportion of the farms, and almost every neighborhood have their own local supply within easy reach. But the inexhaustible source of this material for the region, is the great swamps which extend through the whole of the seaboard region, from the extreme southern border to the Great Dismal, which extends across the Virginia border. A considerable part of these areas designated as "The Swamp Lands," is simply covered by a peaty accumulation—a series of true peat bogs, of which the peat is from two or three, up to ten, fifteen and even twenty feet thick. Of such peat beds there are hundreds of square miles, which must one day become an important resource for fuel as well as manure.

ASBESTOS.

This is, says Prof. Kerr, one of the commonest associates also of the chrysolite beds heretofore mentioned, and it occurs also quite widely in the Laurentian rocks of the middle and western parts of the State. One of the best known localities in the State is that near Bakersville, in Mitchell county; in fact it occurs in two or three places in that vicinity. It is long, fibrous, white and readily reduced to a pulp, or mass of fine lint. An equally fine article is brought from the southern part of

Jackson county. It is also found near Tryon mountain, in Polk county. Another well known locality is in Caldwell county, near the Baker mine. This is associated, like many others, with a serpentine rock. Specimens have been exhibited also from Ashe and from Yancey. This mineral occurs in many places from Warren to Jackson county.

SOAPSTONE.

This is a very common mineral in North Carolina, both in the form of the impure, greenish, massive, or slaty rock (potstone), used for grave stones, and for chimney and furnace hearths and linings, and in the form of a pure massive white steatite. The most extensive beds of this mineral are found in Cherokee and Macon, in immediate association with the marble range and accompanying it throughout its whole extent, on Nantehaleh river, Valley river and Notteley. An analysis of this rock, as it occurs at Jarrett's, on Nantehaleh, gave 23.71 per cent. of magnesia, which is about the percentage for pyrallolite. The variety rensseleerite is found in Forsyth county, and probably also in the South mountains in Burke county.

PYRITE.

Pyrite is one of the most common minerals of North Carolina. It is not only found in globular crystalline masses in many of the marl beds of the eastern counties, but many of the gneissoid rocks and slates contain it in considerable quantities, and besides it is found in almost

every mine of the State. In the gold mines the associated pyrite is generally auriferous. Cubical crystals occur at Hickory, Catawba county, Asbury mine, Gaston county, Soapstone quarry, twelve miles northeast of Statesville, Silver Hill, Gold Hill and many other localities. Combinations of cubes and octahedra are found at Clegg's mine, Chatham county, and in the Guilford county gold and copper mines; the pyritohedron, often in combination with cubical and octahedral planes, is found at the Stewart mine, in Union county, Cambridge mine, Guilford county, Long Creek mine, Gaston county, Rudisill mine, Mecklenburg county, &c. Large veins of compact pyrite occur in Gaston county.

Building Stones.

There exists the greatest abundance of material for architectural and engineering uses, over a large part of the State. Granite and gneiss are among the commonest rocks throughout its whole length, except in the coastward region, where it is overlaid by the Tertiary and Cretaceous beds. And the sand stones of the Triassic, red and gray, as well as those of the Huronian, are available over considerable areas; while the shell limestones of the Eocene furnish a very fair building material to the sandy and alluvial coast region; and the crystalline limestones and marbles of the west supply an

ornamental building stone of great variety and beauty. A particular notice of the marbles of the State, which are of every variety of tint, will be found elsewhere.

Seventy-nine specimens of building stones have been sent from the State to the New National Museum at Washington. These embrace granite of every variety (the beautiful Scotch granite included), gneiss, soapstone, talc, limestone, marble, firestone, limerock, sandstone of various shades and texture, syenite and porphyry.

Precious Stones.

DIAMOND.

This rare gem has been repeatedly found in North Carolina, and the following occurrences have been well established. In every instance it was found associated with gold and zircons, sometimes with monazite and other rare minerals in gravel-beds, resulting from gneissoid rocks, but it has never been observed in the North Carolina *itacolumite*, or any debris resulting from its disintegration. The first diamond was found in 1843 by Dr. M. F. Stephenson, of Gainesville, Georgia, at the ford of Brindletown creek. It was an octahedron, valued at about one hundred dollars. Another from the same neighborhood came into possession of Prof. Featherstonehaugh, while acting as United States Geologist.

The third diamond, at Twitty's Mine, Rutherford county, was observed in 1846, by General Clingman, in D. J. Twitty's collection, and has been described by Prof. Shepard. Its form is a distorted hexoctahedron, and its color yellowish.

The fourth came from near Cottage Home, in Lincoln county, where it was discovered in the spring of 1852, and was recognized by Dr. C. L. Hunter. It is greenish and in form similar to the last, but more elongated.

A very beautiful diamond was found in the summer of 1852 in Todd's branch, Mecklenburg county. It was nearly of the first water and a perfect crystal. It was in possession of the late Dr. Andrews, of Charlotte. Dr. Andrews informed me, says Dr. Genth, that a very beautiful diamond of considerable size, like a small chincapin, and of black color, had been found at the same locality, by three persons, while washing for gold. In their ignorance, believing that it could not be broken, they smashed it to pieces. Dr. Andrews tested the hardness of a fragment, which scratched corundum with facility, proving it to be a diamond. A very beautiful octahedral diamond of first water was found many years ago at the Portis Mine, Franklin county. There is a report that a second one has been found in the same locality.

BERYL.

Occurs in six-sided prisms, sometimes doubly terminated, from about half an inch in thickness, and from one to six inches in length. Their color is yellowish and bluish

green—small pieces of the latter color are sometimes transparent, and might be cut for gems (aquamarine); associated with orthoclase, muscovite, tourmaline, &c., at Ray's Mine, on Hurricane mountain, Yancey county; one imperfect yellowish green crystal, of about one and a half inches in length, has been found at Buchanan's mica mine, three and a half miles east of Bakersville, in Mitchell county; one bluish green crystal, implanted in quartz, has been found at Captain Mills' gold mine, in Burke county.

ZIRCON.

Abounds in the gold sands of Burke, McDowell, Rutherford, Caldwell, Mecklenburg, and other counties, in very minute yellowish brown and brownish white, sometimes amethystine, pink and blue crystals with many planes; large grayish brown crystals of zircons are found so abundant on the south side of the Blue Ridge, near Green river, that General Clingman easily obtained, in a few weeks, 1869, one thousand pounds of crystals. It is rarely found associated with chrysoberyl, at Ray's mine, Hurricane mountain, Yancey county.

GARNET.

Is widely distributed throughout the State and a constant constituent of many of the mica and hornblende slates, in which it occurs in minute dodecahedral and trapezohedral crystals of a brownish or brownish red color; it also occurs in many of the talcose and chloritic slates; larger trapezohedral crystals of a brownish red color are

frequently met with in the mica mines of Mitchell and Yancey counties; imperfect dodecahedral crystals at Weaver's, Janestown, Rutherford county, and in talcose slate in Rockingham and Cherokee counties. The most beautiful and perfect crystals are large trapezohedra, of a brownish red color, from Burke, Caldwell and Catawba counties. Some of these are transparent, and, when cut show a peculiar play of colors. Large crystals and crystalline masses of a reddish brown garnet, are found near Franklin, Macon county, and on Toe river, Mitchell county. Pyrope, of good color, has been observed in the sands from gold washings in Burke and McDowell counties. The massive manganese garnet is abundant at Janestown, Rutherford county, at Buckhorn, Chatham county, near Moore's Mills, Stokes county, near Gold Hill, in Cabarrus county, near Brevard's Forge, one and a half miles from the Vesuvius furnace, and near Macpelah church, Lincoln county, near High Shoals, Gaston county, and near Madison, Rockingham county.

AGATE.

Rough specimens of this form of quartz are very common, for example, in Cabarrus, near Harrisburg and Concord, and in Mecklenburg; and occasionally a handsome gem has been found among them. But a year or two ago some very fine specimens of moss agate were discovered near Hillsboro. It is found in Granville county also, and elsewhere.

OPAL.

A number of gems of this species have been found in the State. Within the last twelve months a large number have been picked up in Concord, Cabarrus county, some of them of much beauty and high market value.

HIDDENITE.

From a late publication of Professor Kerr:

Hiddenite is an *emerald-green* gem, quite as handsome and as highly valued as the emerald proper, or the diamond. It is found in no other spot on the earth's surface save one, in the eastern edge of Alexander county. The mineral species to which this variety belongs is *spodumene*, which, as ordinarily found, has as little claim to be considered a gem as a common crystal of felspar.

A considerable amount of work has been done in mining for the gem by Mr. Hidden. The crystals are found, not in veins, but in nests or pockets, of which perhaps a dozen have been found within a depth of thirty-five feet. These pockets contain, besides hiddenite, emerald, quartz, rutile and other crystals. The value of some of these other minerals has exceeded that of hiddenite. Emeralds have been found worth \$1,000 each.

Mr. Hidden writes: "The mine has never supplied twenty-five per cent. of the amount ordered by the trade; only lately I made a \$1,300 sale of three emeralds and hiddenites to a gem collector. We continue to find emeralds, beryls and hiddenite; also many interesting asso-

ciated minerals. The hiddenite is the least common among them." "This is the only strictly *American* gem," and it may be added, it is strictly a *North Carolina* gem. He reports that "*it is already recognized as a gem of the highest rank.*"

A company has been organized with a capital of \$200,000, with a view to larger and more systematic operations, and thirty hands are employed. A shaft has been sunk thirty-six feet, and a tunnel cut two hundred and sixty feet, mostly through rock. The largest emerald found is eight and a half inches long and weighs nine ounces.

This inaugurates in the State an industry entirely new to this country. There have been a few sporadic efforts heretofore, at several different places and times, at mining for sapphires and rubies, and a number of very respectable gems have been picked up, but nothing like a regular business of this sort has been yet established anywhere in this country. Hiddenite may be set down as the thirteenth species of gem found in North Carolina.

EMERALD,

A beryl, is found mostly in the mica mines of Mitchell and Yancey; an 8-inch section of one, two feet long and seven inches thick, is in the Museum, from a mine near Bakersville, and a block one foot long from another, which must have weighed hundreds of pounds.

Aquamarine, beryl, also, of a different color.

RUBY.

Ruby—Corundum, found as a gem in Clay and Macon, may also be found in other corundum localities in Jackson, Mitchell, Iredell, Gaston, &c. The largest crystal of ruby corundum in the world (twenty inches by seven) from Macon, was burned up the other day at Amherst, in Shepard's magnificent collection, together with a larger number of rare and fine North Carolina minerals than existed elsewhere.

Ruby—Spinal, deep color, Jackson; found last year in some gravel sent by mail, rough, imperfect, but suggestive.

SAPPHIRE.

Sapphire, corundum—Found as above; a number of very pretty gems have been picked up.

Sapphire, kyanite—Best are found at Swannanoa Gap and top of Black mountain; the common sort in Mitchell, Gaston and other counties.

Rock Crystal, false diamond, California diamond—Abundant in this State.

In addition, it is worth while to mention that specimens of *opalescent* quartz, occur in Cabarrus and elsewhere; also malachite, carnelian, jasper, chalcedony, rutile, tourmaline, chrysolite, lazulite and smoky quartz; so that our list of native gems is certain to be extended, and very considerably, too, whenever extensive mining operations are resumed.

Of the entire list of *real gems*, nine have been found as such in this State; and of the minerals which consti-

tute these gems, all but one occur here; so that it is not improbable that we may complete the list as soon as mining industries take root among us.

And of minerals which furnish the *semi-gems*, a majority also occur in this State. This fact is explained, just as the other broader fact, of the occurrence of so wide a range of mineral species. It is due to the prevalence of the older rocks, which make up almost the whole of North Carolina, geographically, outside of the overmantling sands and gravels of the east.

Mineral Waters.

From Prof. Kerr's Report :

Both Chalybeate and Sulphur waters are of common occurrence in the State and in all sections of it, the former eminently so. Alum waters are also of frequent occurrence. In the eastern section, the abundance of peat and muck insures the prevalence of carbonated waters, which are continually dissolving the iron oxides from the ferruginous Quaternary earths, and in their issue in springs at the foot of the slopes and in the ravines, they come charged with this element, which is deposited in a flocculent ochreous precipitate, along the course of the streams. In the granitic and slaty regions of the middle and west, the presence of iron and alum is due to the decomposition of the iron pyrite, so widely diffused in the gneisses, granites and slates.

“Simple Chalybeate springs, where iron is dissolved by the agency of fixed air,” says Dr. Olmsted in his report, “are common in almost every part of this region (the middle section). Such waters are well fitted to relieve the langour induced by a warm climate, and are, perhaps, more salubrious for frequent and constant use, than the stronger and more complicated mineral waters.”

There are numbers of mineral springs in the middle and western parts of the State which are noted for the efficacy of their waters in various forms of disease; among these the Sulphur Springs of Catawba, Cleveland and Haywood are of high repute.

“In the lower part of Buncombe,” (now Madison) says Dr. Mitchell, “are the Warm Springs, with a temperature of 104° . They rise on the bank and in the bed of the French Broad, give out considerable quantities of nitrogen, but contain very little mineral matter of any kind.”

Mining in North Carolina in 1885

The auriferous area of North Carolina in a general way embraces nearly one-half of the State; the productive area is much less, containing a little more than twelve thousand (12,000) square miles.

Warren county on the northeast, Moore county on the southeast, and the Tennessee line, mark approximately the east and west boundaries of the gold field; it extends on the north into Virginia, and on the south into South Carolina, and comprises the best known and most productive part of the Appalachian gold belt.

GEOLOGICAL DISTRIBUTION OF THE MINES.

The best known mines are on the central belt of granite (using the word in a general way), stretching across the State in a northeast and southwest direction with a width of ten (10) to twenty-five (25) miles; the towns of Greensboro and Charlotte are nearly on its axis; this area is commonly regarded by geologists as among the oldest on the American continent. This area is tentatively classed as

LOWER LAURENTIAN.

To the east is a large body of slates, generally argillaceous, but frequently departing from that type, with a width varying from fifteen (15) to fifty (50) miles; this region also abounds in mines, but it has been less explored. The formation is Upper Laurentian and Huronian, the latter predominating.

To the west is a still larger area, made up for the most part of gneissoid and schistose formations, and extending nearly or quite to the Tennessee border; this area, too, has a large number of gravel and vein mines. This part of North Carolina is commonly held to be Upper Laurentian.

Warren, Franklin and Nash Counties.

The extreme northeast deposits occur in Warren, Franklin and Nash counties, and cover, so far as explored, an area of about one hundred (100) square miles, being fifteen (15) miles long in its northeast and southwest axis, and five (5) to seven (7) miles wide.

The Thomas mine one and one-half ($1\frac{1}{2}$) miles northeast of Ransom's Bridge, is the extreme northeast point worked, so far as known to the compiler; the area to the southwest extends beyond Peach Tree creek, and nearly to Tar river. It is probable that the auriferous area is considerably more extended than these limits would indicate, but the productive area is practically confined in these boundaries.

The formation is described by Emmons as Taconic, and by Kerr as Upper Laurentian, and consists of gneisses and mica schists for the most part; it is rich in ferruginous minerals, whose peroxidization and alteration have extended very far below the surface, making a deep red, tenacious clayey soil. The whole area bears evidence of great surface disturbance and reërrangement of the superficial material—possibly of several reërrangements. The bed rock lies from fifteen (15) to twenty-five (25) feet deep, and is itself much peroxidized and altered.

A conspicuous phenomenon is the great abundance of quartz seams from a line to one and one-half ($1\frac{1}{2}$) inches thick. These commonly run with the bedding, but sometimes across both the course and dip. They are generally

called veins, and are mostly of sugary or granular quartz, often seamed and filled with oxide of iron, and always soft and easily crushed. Other seams are of glassy quartz, and frequently of even greater width, but are held to be unproductive.

Gold appears originally to have been in these narrow seams of sugary quartz, which, in the usual process of weathering, have been broken down and into fragments widely distributed over and in the soil, and gradually concentrated on the bed-rock in favored sinks or channels. It is by no means certain, however, that the gold was originally confined to these seams, for it is quite in accordance with the analogies of its occurrence elsewhere in the Carolinas and Georgia that the entire "country" matter of gneiss, etc., may also have the precious metal sparingly distributed within it, and from which it has also been concentrated.

Occasional masses of the "country" show a curious alteration, during which apparently the basic matter has been removed, and only the quartz left in a very soft and crumbly condition—an example of a process of "silicification," which is very marked in some parts of the Appalachian gold belt, and which has seemingly resulted in charging the entire mass with gold. I was unable to learn to what extent such material occurs in this belt, nor its value, but some examinations and assays would indicate it to be suitable material for exploitation.

For fifty or sixty years the richer areas, and those which are most easily accessible, or which lie most con-

venient to the water, have been worked till exhausted or no longer profitable. Remunerative work of this character will gradually cease. Operations on a more extensive scale, by true hydraulic methods, have also been attempted, and probably will, in the future, be carried out on still larger plans.

A vast amount of gravel has been accumulated by such work, most of which is gold-bearing, and some of which might be milled with a small profit.

Assays of such material indicate contents of \$2.07 to \$3.10 per ton.

A detailed and exact study of this section has never, so far as I am aware, been attempted, and hence anything like a full representation of its resources is necessarily inadequate.

THE PORTIS MINE

has been the most exploited, and, from operations here, the entire district may be best understood.

This mine lies in the northeast corner of Franklin county, and quite near to both Nash and Warren counties. The mining tract contains 938 acres, and is equipped with a plant of hydraulic apparatus. The mill has recently been enlarged to 15 stamps, and a still further addition of 35 is contemplated. The mill is also provided with an Alden crusher, and concentrators.

The mine is situated on a hill 108 feet above Shocco creek, from which the water for work is derived.

A large amount of preparatory work was performed in the latter part of 1885, and it is believed that the

work of 1886 will be vigorously pushed, with a corresponding increase in the production.

The hydraulic methods, now largely used in South Carolina, and still more largely in Georgia, point out the general line of solution of the mining problem here. A lift of water of 100 or even 200 feet, is now a mere trifle to the mining engineer, and in addition with a pressure which is equivalent to a head of 50 or 100 feet at the point at which the water is used.

This column of water applied to a body of surface material rapidly "dissolves" the softer part of it, and washes it away, depositing its precious contents in the sluices; if these sluices be given a slope of even four (4) inches in twelve (12) feet, the current itself will readily bear away the quartz, partly pulverizing it, and delivering it at some suitable point in the mill-house for stamping. The work is almost wholly automatic; the outlay for the plant is not excessive, and the expense of maintenance is small; the cost of treatment per ton is surprisingly low.

The application of this mode of treatment is entirely feasible, and, in the judgment of the writer, is the only one economically applicable.

The remarks on the Portis apply to the others for the most part, the best known of which are indicated in the following list:

The Thomas mine, one and one-fourth ($1\frac{1}{4}$) miles northeast of the Portis, contains 450 acres.

The Kearney is two and one-half ($2\frac{1}{2}$) miles northwest of the Portis.

The Arrington, two (2) miles southeast of the Portis, in Nash county, contains 2,000 acres.

The Taylor is five (5) miles southwest of the Portis.

The Mann, with 1,000 acres, is six (6) miles southwest.

The aggregate of the regular employees is twenty-five (25) persons; possibly as many more give a part of their time, otherwise unoccupied, to crude mining work.

The southeast extension of the Upper Laurentian is overlaid by the Quaternary, a little to the south of Raleigh, and no gold mines are known beyond this point.

THE HURONIAN.

In Moore county, has two (2) belts, one ten (10) miles northwest of Carthage, and one-fourth ($\frac{1}{4}$) mile west of the Red Sandstone, and the other eight (8) miles further west, in the northwest part of the county, and probably connected with the most eastern of the Montgomery county belts.

The Bell mine is the only mine worked in the former; the immediate country is a silicious talcose schist, slightly mineralized; several narrow belts occur on this property, with finely disseminated iron pyrites, which is commonly auriferous, as shown by several assays, viz: \$1.44 to \$5.02 per ton; the latter figure is probably much above the average.

The vein worked will probably be found to be one of these belts more highly charged with gold—in other words, a bedded vein; its mass is a talco-chloritic schist

very silicious and much altered; in many places the talco-chloritic matter has become almost entirely silicious in seams, and in such cases is generally enriched.

These seams, reddish to greenish in color, are usually quite persistent in the direction of the strike, but vary in width from one-eighth ($\frac{1}{8}$) to three (3) and four (4) inches; the width of the ore body varies from three (3) to six (6) feet, and averages fully four (4) feet.

As an ore body the material is unique, and commonly does not give in its external appearance any indication of its value; it has almost no sulphurets.

The rich quartz seams assay from thirty (\$30) to thirteen hundred (\$1,300) dollars per ton, while the entire vein matter will average from twelve (\$12) to fifteen (\$15) dollars per ton. Assays of *strict* averages give \$14.47 and \$14.34 on the seventy-five (75) foot level.

The vein has been sunk upon to the depth of one hundred and ten (110) feet, the last ten (10) being an incline in the vein itself. This body has been opened on at intervals for nearly 800 feet, and more or less work has been done on the surface along this distance, but the productive part, which has been worked in depth is about one hundred and thirty (130) feet long.

The gold is unusually "leafy," and often occurs as a very thin plating on the surface of the schists.

Six (6) miles northeast of the Bell and one (1) mile north of Deep river, and possibly in the same geological horizon is the

CHICK MINE.

The body of ore has been sunk upon to a slight depth, but without much judgment, and so slightly explored as to be practically unknown.

The external indications of copper are especially marked, and the entire body is seamed and stained with the blue and green cupric carbonates, which give the surface material an appearance of richness much beyond the reality; so far as examined, this results from the alteration of the black sulphuret of copper (chalcocite).

Many assays of the material run from \$2.65 per ton for gold and silver and a trace of copper, to \$18.17 for gold and silver with $17\frac{4}{10}$ per cent. of copper.

THE PHILLIPS TRACT,

two and one-half ($2\frac{1}{2}$) miles northeast of the Chick, is quite similar, but has hardly been touched, and its real value is practically unknown; twenty (20) feet is the greatest depth reached.

The second belt alluded to in the northwest part of Moore county is extremely interesting mineralogically as well as economically.

This group of mines, embracing nine (9) well-known localities, is comprised in a space two (2) miles wide from northwest to southeast, and six (6) miles long from northeast to southwest; these boundaries, however, are not the actual limits of the auriferous area, but only of the productive part.

The formation is talco-chloritic schist, but everywhere very silicious, and traversed by lenticles of quartz, some-

times conforming approximately to the bedding, but more frequently across it. The surface of the whole country, particularly to the eastward, is strewn with quartz, which probably came from the long weathering of the strata bearing these lenticles. The veins so-called are simply "bedded veins," and are the richest parts of the auriferous strata. In entering this area the

BROWN MINE

is met on the northwest edge, on the road from Moffitt's to Richardson's mills, and one and one-half ($1\frac{1}{2}$) miles southwest of the latter. It was worked for three hundred (300) yards and forty (40) to fifty (50) feet deep; the dip is very flat; the ore body is three (3) feet wide, but the "pay streak" was a narrow seam of quartz; the surface bears witness to a considerable production.

THE BAT ROOST

is one and one-half ($1\frac{1}{2}$) miles northeast of the Brown.

THE SHIELDS

is two (2) miles south, and adjacent to the east edge of the belt. It has been occasionally operated for years, but its history is not well known.

THE CAGLE MINE,

one (1) mile south of the Shields, is also on the east edge of the belt; the mining tract embraces five hundred (500) acres, mostly on the east side of Cabin creek.

This mine is entered by two (2) underlay shafts in the vein, the deeper being one hundred and sixty (160) feet on the incline.

The ore body is a quartzose-talcosc schist, with a small amount of disseminated iron pyrite, and a trace of copper pyrite; the vein is estimated to be from two (2) to nine (9) feet thick. The assays made by the writer have run \$5.33, \$6.20, \$27.19 and \$39.88 per ton, the latter being exceptional, as the average ore is of a rather low grade; the ore body is large and the material abundant. The plant of machinery consists of 20 stamps.

Unlike most of the mines of this belt, the work is wholly underground.

THE CLEGG MINE.

A tract of thirty (30) acres, one-fourth ($\frac{1}{4}$) miles west, on the opposite side of Cabin creek, is made up of the same kind of schists, but the ore body is larger, *i. e.*, the entire formation is ore, but at the same time much lower in grade; above the level of the running water of the neighborhood it is much altered and peroxidized, and quite soft—too soft for perfect security in mining.

It is worked by open cuts, and can readily be picked and shovelled out. The milling is done by a ten (10) stamp battery.

THE MORRELL MINE

is one-fourth ($\frac{1}{4}$) mile southwest on the east side of Cabin creek.

THE BURNS AND ALRED MINE

or Burns mine, as it is more commonly called, has seventy-five (75) acres, and is the best example of this class of deposits.

The ore was milled for forty (40) years by the old-fashioned North Carolina methods, by Chilian and drag mills, and with unusual success; with so much success, indeed, as finally to tempt an ambitious promoter of mining schemes to introduce a new and untried kind of "process" machinery, which, as a matter of course, failed, and to the injury of the good name of the mine and of the neighborhood.

Though this mining tract proper is of small area, a considerable body of mining territory is generally worked in connection therewith, the whole aggregating 250 acres. Cabin creek, a bold and deep stream, courses around the west and northwest edges of this tract.

It is difficult to say what is ore, and what is not, in this area, for it is everywhere auriferous, though not everywhere capable of being operated economically. The formation is a very silicious-talcose schist, somewhat chloritic.

The best known localities in this tract are Moody Hill, near the east boundary, and Brown Hill, toward the western. The former has been worked most extensively, and in both places the mining has been almost entirely by "open cut." The selection of places for exploitation has been almost exclusively determined by the results of mill runs of the ore, or by panning, and

while this way of work has been wasteful in some respects, it was probably the best method available.

The cuts are scattered about promiscuously, without much evident connection or relation, and are usually very irregular in outline. The cut most largely worked has, for its so called foot-wall, a very silicious schist alternating with chloritic schists, while the hanging-wall is more chloritic and less quartzose; the bedding dip northwest 40° to 50° .

Here an ore body twelve (12) feet thick has been exploited, assaying \$5.17 per ton, but it is quite certain that the material will not average so much in the long run, though working averages of \$3.00 may probably be depended on, and, at long intervals, schists of very high grade have been found and may be expected at any time.

This belt extends one (1) or two (2) miles further south.

Montgomery County.

The western gold belt of Moore county probably is connected with the southeast belt of Montgomery, but the relations of these belts have been so little studied that no certain statement to this effect can be made.

The formation of this county, like that of the western part of Moore, is Huronian, but the silicious-talcose schists, with a few exceptions, change about the middle of the county into clay slates, thin-bedded and gray to greenish in color.

This county abounds in "gravel" and in vein mines, but the veins are of a bedded character.

Three (3), and perhaps four (4), well-defined belts of auriferous territory are known. These belts are from four (4) to eight (8) miles wide, and extend nearly or quite across the county from northeast to southwest.

The most easterly belt embraces the Swift creek and the Sam Christian gravel mines, the Carter and Reynolds vein mines, the Wood gravel and the Moore vein mines. Of these, only the Sam Christian has gained more than local fame, and is the only one at present worked.

The gold in this mine occurs in ancient "channels," in gravel of a thickness of one (1) to three (3) feet, and sometimes covered with soil to a depth of thirty (30) feet. It is rarely found in dust or grains, but generally in nuggets of five (5) pennyweights and upwards into the thousands.

I cannot learn that any record of the yield of this mine has ever been kept.

This property of 1,286 acres has been worked in two (2) places, "Dry Hollow" and the old "Sam Christian cut," but other channels are known to exist.

The method of work pursued in this mine consists in a simple removal of the soil resting on the gravel, followed by a careful washing of the gravel in sluices and rockers. When the soil is shallow, it is often removed by simple digging; otherwise it is washed away by a powerful hydraulic stream. The harvest periods are very intermittent and uncertain, since a long time is re-

quired to remove the superficial matter in order to reach the gravel, and a few days or even hours will often suffice for obtaining a large reward for weeks or even months of unrewarded toil.

The obvious method of treatment is the hydraulic, but, unfortunately, the locality is on an elevation of 190 feet—a matter which, of itself, is not a serious obstacle. There is, however, a very scanty supply of water in the gulches, which cut the hills, and the most careful husbanding of the supply suffices only for a very moderate amount of work, and chiefly in the winter and spring. A survey has been made from this mine to the Yadkin river, three (3) miles distant, at Swift Island Ford. This supply would furnish an abundance of water.

The second and parallel belt is four (4) to six (6) miles northwest, and comprises a line of "gravel" mines on the northwest of the Uwharrie mountains, and between it and the Uwharrie river. The localities within the knowledge of the compiler are the Bright, Ophir, or Davis, Spanish Oak Gap, Dry Hollow, Island Creek, Deep Flat, Pear Tree Hill, Tom's Creek, Harbin's, Bunnell Mountain, Dutchman's Creek, and the Worth mines, the latter being near the junction of the Uwharrie river and the Yadkin.

The Bright, Dry Hollow, the Worth, and the Bunnell Mountain are the best known, but only the Bright and the Bunnell Mountain have been worked of late.

I believe that these gravel mines do not extend further north than Barnes's creek, near the north line of the county.

The supply of water is entirely inadequate for the working of these properties, and the tailing ground is not always favorable; moreover some mechanical difficulties, caused by the admixture of clay with the gravel, have prevented an extensive exploitation of them.

It may be mentioned, in this connection, that at the Bright mine there is also a massive formation, several hundred feet wide, quite like that of the Russell.

These localities are but a very short distance from the easternmost of the next northwest belt.

The more prominent mines of this third belt are the Steele, the Saunders, Henderson, Coggins, Morris Mountain, Russell, or Peebles, Little Russell, McLean's Creek, and Beaver Dam.

The first three named carry chiefly argentiferous or auriferous galena; the Coggins, Morris Mountain, and both the Russells are bedded ore masses; the last two of the list are gravel mines.

This formation passes into Randolph county, and embraces a prominent group there.

The Steele and Saunders are near the eastern edge of the belt, just to the east of the Uwharrie river. The former has been the most worked; the ores were largely free milling at the outset, but, at the depth now worked, have passed into galena and blende, with a small proportion of copper pyrite, all argentiferous and auriferous; the vein (a bedded one) is seven (7) feet wide, with a "pay streak" of ore apparently three (3) feet thick.

THE SAUNDERS

is simply the northeast extension of the Steele, and they are separated only by the accident of ownership; the entry shafts are barely one hundred and fifty (150) feet apart.

Very little work has been done at these mines for some years, but they are likely to be vigorously worked this year.

The Henderson, two (2) miles west of the above, at Eldorado post office, also a bedded vein, has been sunk upon only a few feet, and not much is known of its value; the mineral matter is blende, galena, copper pyrites and iron pyrites.

THE COGGINS MINE,

one and one-half ($1\frac{1}{2}$) miles northwest of the Steele, is a recent discovery (1882), and has been sunk upon less than fifty (50) feet; the work has not been sufficiently extended to give thoroughly satisfactory information of the ore bodies; so far as exploited, there appear to be two (2) bodies separated by a barren body of a few feet in thickness; in reality, the ore bodies are auriferous slate, with a comparatively barren body of like character between. The schists course N. 40° E., and dip steeply to the N. W.; the thickness of the workable beds is variable, but will probably average together not less than twenty (20) feet, and it is by no means certain that the explorers have found either the hanging or foot walls, using these terms freely.

The body was originally chloritic-argillaceous schist, but is now largely altered and peroxidized.

The ore, as a rule, assays very low, but the size of the bodies, the softness of the ore, and the cheapness of treatment, combine to make this property very promising. Nothing beyond exploratory work has been done here yet, and the machinery used is of the crudest sort.

THE MORRIS MOUNTAIN MINE,

a tract of 350 acres, one (1) mile nearly west of the Coggins, is also known as the Davis or Dutton mine; some bodies of the slates here occasionally prospect well, and at rare intervals the slates are plentifully sprinkled with free gold, but I am not aware that any large workable body has yet been discovered.

THE BEAVER DAM MINE,

at Flaggtown post office, three (3) miles southwest from Morris Mountain, and two (2) northeast of the junction of Beaver Dam creek and Yadkin river, contains a mining tract of 800 acres, one-half ($\frac{1}{2}$) of which is claimed to be underlaid by gravel. This gravel is from two (2) to four (4) feet thick, and overlaid by an alluvial deposit five (5) to fifteen (15) feet deep.

Numerous seams of quartz everywhere course through the formation and are probably the largest source of the gold, but there is probably also a considerable amount due to the breaking down of the slates themselves.

A massive body of chloritic schist exists, assaying moderately in gold, but, so far as I am aware, never worked. With these exceptions nothing resembling vein matter has ever been found.

The supply of water afforded by the Beaver Dam creek is ample for extended operations, and hydraulic work is the only feasible method here; mechanical difficulties only prevent successful exploitation.

The "gravel" is mixed with a tenacious clay, which seriously hinders the recovery of the gold; if this mechanical difficulty could be overcome, continuous and profitable work would probably result.

THE RUSSELL OR PEBBLES MINE

is near the north boundary line of the county.

Here an enormous body of sulphuretted ore is available; the amount of iron pyrite is not large, and will probably not exceed three (3) per cent.

The ore body is made up of silicious talcose schists alternating with silicious schists, the whole much altered. It is exclusively worked by "open cuts," and immense bodies of low grade ore are open to the day.

The assays of the ore range from \$2.07 per ton to \$22.86, and, at very rare intervals and in extremely small quantity, into the thousands; as a whole the range of values is low.

RIGGINS HILL AND THE LITTLE LEAD

are open cuts in other ore bodies on the same property.

The mine was re-equipped in 1885, and has had a successful run of three (3) months. Seventy-five (75) men are employed.

THE UWHARRIE (FORMERLY GRAVES) MINE, two (2) miles south of Lassiter's mills in Randolph county, and quite near the Russell, has a similar formation.

Randolph County,

like Montgomery county, abounds in mines.

Only the following were worked in 1885: the Sawyer, Jones, Winslow, Lafflin or Herring, Jones or Keystone, Davis Mountain, Winningham, Slack, Graves and Hoover Hill; only the last has been extensively worked, the former were only prospected.

All these mines are in "slate," but the relation of these belts has not been carefully studied; probably in their southwest extension they are continuous with the two (2) western belts of Montgomery county.

Some of these are deserving of special mention.

The Winningham and Slack are two and one-half ($2\frac{1}{2}$) miles south of Ashboro, the Davis Mountain four (4) miles southwest of Ashboro; the Sawyer five (5) miles northwest; here the ore body is massive and consists of several parallel beds of silicious-talcosc schist in an advanced stage of disintegration, and sometimes forming a body of fine sand loosely coherent. These schists are auriferous, and the workable bodies are sufficiently near each other to be worked simultaneously.

This property formerly had a good record.

The Winslow is five (5) miles southwest of Ashboro; little work was done there, although it is equipped with ten (10) stamps.

The Jones or Keystone, the Lafflin or Herring, and the Delft are quite similar in character, and a description of the

JONES

will approximately indicate the character of the others.

This mine, or rather tract of mining land, comprising $293\frac{1}{2}$ acres, is twelve (12) miles southeast of Thomasville, and not far from the Davidson line. The entire country is a soft and rather silicious-talcose schist, with a chloritic tendency. The weathering, to a depth of forty (40) feet, and possibly more, has effected a peroxidization of the ferruginous constituents, so that it has become a mass of reddish clay. At the same time disintegration has proceeded so far that the mass can be readily picked to pieces. The more deeply colored earth is generally the richer, but gold is universally present over the whole country. The mining, however, is confined to certain well-known channels or belts, which are more richly charged.

The presence of the gold is probably most largely due originally to the presence of iron pyrite, which, through peroxidization, has liberated the precious constituents; but it cannot be overlooked that, in the more valuable belts, fine sand (quartz) is more abundantly distributed, and in such a manner as to point to a natural association of the quartz and gold.

Occasional "horses" of strata are found charged with finely disseminated iron pyrite, and yet unaltered to any extent, and still solid and firm; these, whatever their

contents, are commonly avoided, from the comparative difficulty both of mining and milling.

The work is almost entirely open to the day. The surface is everywhere cut into gulches, which allow easy and cheap entry by open cut into the bodies of ore, and at the same time facilitate easy transportation by gravity cars to the mill.

The disintegrated soil allows of mining at a marvelously cheap rate, frequently not exceeding fifteen (15) cents per ton delivered at the mill.

The treatment so far made use of is that by stamp battery, and is apparently the best available. If the supply of water were ample, and with sufficient head, there might also be a hydraulic treatment of certain parts of the surface.

The assays have run \$2.07 per ton, \$3.11, \$3.61, \$4.65, \$6.20 and \$28.92. The last is exceptionally rich, and the second is nearer the average. Bodies of high grade material are occasionally found, but they are very limited in extent.

The primary condition of success with such low grade mine stuff is the handling of large quantities, and for this a very large amount of water is needed.

The water supply is deficient, consisting chiefly of the natural flowage of one (1) small branch, and of accumulations in dams during the rainy season.

The Uwharrie, a bold stream, is only two (2) miles distant, but at a lower level. No grave obstacles prevent the lifting and flowing hither of its waters.

The mill is equipped with ten (10) stamps.

THE HERRING OR LAFFLIN MINE

has a Howland pulverizer. This mine is thought to have a better natural supply of water than the others.

THE HOOVER HILL MINE,

now operated by a London company under the name of the "New Hoover Hill Gold Mining Company, Limited," comprises 250 acres. It is seventeen miles a little east of south from High Point.

This mine has had a curious history. In the early days of mining the yield was large, and the profits something fabulous. This prosperity continued while the ore lasted, which had been subjected to weathering, and was easily treated. Since that time, and during the treatment of the compact and unaltered ore, its history has been one of failures till the year 1884. It finally came into the hands of a London company, which did little to redeem its record for two (2) years. The company, disheartened, was on the point of going into liquidation, but concluded to make one more effort, which, under the present skillful superintendent, William Frecheville, proved entirely successful.

The "country," which apparently is an altered schist, very hard and compact, is traversed by belts which abound in quartz seams, ranging from a line to a foot in thickness. While the seams show no traceable regularity in the respective belts, the belts themselves show a marked persistence. It was the outcrop and upper part of these seams which originally gave such large returns. It was

the prediction of Mr. Frecheville that the shoots which were so rich above would also be productive below, and his forecast was correct. The splendid returns of the last two (2) years have fully justified all efforts to put the mine again on a working basis.

There are several of these belts; the principal one is the "old Briols Shoot," which is entered by the Briols and the Gallimore shafts. This is the body most largely depended on. At no great distance from this shoot are six (6) other belts lying quite closely together, and worked from the Hawkins shaft, which has reached a depth of 135 feet. This shaft will be sunk deeper in 1886.

"In the Hawkins part of the mine, the No. 1 and the No. 2 ore bodies have fluctuated considerably as to size and grade during the year, but, on the whole, have produced well. They have recently been cut off by cross courses of green-stone. In the case of the No. 1 ore body, we have drifted through the green-stone and secured the ore body on the other side; and in the case of No. 2, we are sinking an incline from the bottom of the No. 2 slope through the green-stone, and will recover the ore body on the other side."

The old Briols shoot, which gave renown to the mine, is now down 300 feet. The superintendent says: "We are drifting at 290 feet, but we are not far enough advanced to allow us to judge of the character of the chute of ore at that depth. At the 230 feet level it is about 80 feet long by from 18 inches to 10 feet wide, and worth \$8 to \$10 per ton. The Briols shaft is being sunk deeper."

The mill was erected by Beckett & McDowell, and contains four (4) five-stamp batteries, with other appliances suitable to the work.

"7,635 tons of ore were crushed in 1885, producing \$68,400; * * * for the year ending September 30th, 1885, a profit was made of £6,698.6.2, of which £6,000 was distributed in dividends. Seventy to ninety men were employed."

The occurrence of the gold is invariably associated with the quartz seams, though these sometimes occur without enriching the ore body; iron pyrite is generally present to the extent of three (3) per cent.; it is generally found on the sides of the quartz seams, between them and the accompanying gangue.

AT THE WILSON KINDLEY MINE,

one-half ($\frac{1}{2}$) mile southwest, no work was done; the formation is similar to that at Hoover Hill.

Allusion was made to the Graves or Uwharrie mine, in immediate connection with the Russell, and under the head of Montgomery county.

Stanly County.

The most west of the Montgomery belts is supposed to continue into Stanly county, where, as might be supposed from the examples given, and of the wide distribution of gold, there are numerous localities which have earlier or later received attention at the hands of the miner; of these no one was worked uninterruptedly in 1885, though a little desultory work was accomplished

at Rock Hole and Hog creek in gravel mining, and at the Parker, Crowell and Barringer mines.

Among the more noted mines are the Haithcock and the Hearne, two (2) miles northeast of Albemarle.

Little is now known of these exactly, but the amount of underground work indicates satisfactory return; like most mines of the section, they were apparently abandoned when the water level was reached, and the character of the ore changed.

The Hearne, in its northeast extension, is the Haithcock; the course of this vein is nearly northeast and southwest, and at its northeast end runs into and merges with the Lander, which has a course N. about 70° E.; the Hearne and Haithcock are two (2) to four (4) feet wide; the Lander is six (6) feet.

Both veins are evidently filled most largely with quartz, but the characteristics of these ore bodies as a whole cannot now be ascertained; their old reputation is good.

THE PARKER MINE

is at Bilesville, ten (10) miles southeast from Gold Hill. This property of three or four acres has given enormous returns, and the amount of nuggets found is marvellous; a vast extent of work has been done to find the "vein," but I am not aware that anything like a vein has been discovered; it is probable that the surface is an intricate network of quartz seams; the whole surface strongly suggests the Portis mine, and like that locality invites a hydraulic treatment, for which, however, water is not convenient.

THE CROWELL MINE

is in the same neighborhood. The vein is bedded, and the ore body is four (4) to seven (7) feet thick; frequently the whole body will pay to mill; the "pay seam" is much narrower, and often becomes only a line in thickness; the ore cannot readily be differentiated from the surrounding country, for the schists are the same, only auriferous to a working degree; they are talcose with a marked chloritic tendency, and in altering become quite silicious; they contain finely disseminated iron pyrite, which by peroxidation stains the entire body red and brown. The greatest depth is one hundred and twelve (112) feet.

Ore assays are: \$8.00 per ton, \$10.40, \$23.76, and \$169.77.

The western strip of mining territory in Stanly county is adjacent to Gold Hill, and is comprised in the belt stretching from Davidson county to Union county.

The mineral localities in this belt in Stanly county are not less than twenty (20) in number, but few of them have more than a local reputation.

THE BARRINGER,

four (4) miles southeast of Gold Hill, has been too little explored to allow of a correct classification; enormously rich pockets with ore in small amounts assaying from three hundred (\$300) dollars and upwards have been found, but nothing is known of their number or extent; in truth, the very extent of the "finds" has plunged the mine into litigation fatal to successful work.

Union County.

It is not known that the central belt of Stanly county continues into Union, for the mines of this county, with two (2) or three (3) exceptions are readily traceable in alignment with Gold Hill, Silver Hill, Silver Valley, Conrad Hill and other mines of the Davidson county belt.

This magnificent stretch of seventy-five (75) miles contains most of the noted and productive mines of the State; it is in the extreme west of the slate region, and in immediate proximity to the so-called "granite area," which forms the backbone of the State. It embraces a great number of precious metal mines, where the gold and silver are associated with other valuable metals, e. g., copper, lead and zinc—associations, which are not so often met with outside of this belt.

This belt commences at Conrad Hill, near the Three-Hat mountain, about the middle of the eastern boundary of Davidson county, and runs through it in a direction nearly S. 40° W., to the southeast corner of Rowan and the adjacent corner of Stanly, through the eastern part of Cabarrus, and the western part of Union, nearly to the South Carolina line.

The mines of Union county are nearly all comprised in this belt, and are near the western edge of the county, adjacent to Mecklenburg; all are in slate, but are not far remote from the granite.

The whole extent from Cabarrus county to South Carolina is, with scarcely a break, crowded with mines,

which, in the early days of mining, were the best known along the entire belt.

The ores found are readily classified into auriferous and argentiferous galena, auriferous iron pyrite and auriferous slates, but sulphurets are never absent from the latter. Copper ores are of incidental occurrence at several of the mines, but have not hitherto been found in quantity in this county.

No mines are now worked on a notable scale, but several have been operated in a desultory manner, chiefly the Davis, Phiffer, Lewis, Hemby, Harkness, Howie, Washington and Crump.

The Howie, the Wyatt, the Washington and the Penman together form the

“GRAND UNION GOLD MINES.”

They comprise an area of 1,941 acres.

THE WASHINGTON,

eight (8) miles a little south of west from Monroe, is the most southerly of the important mines in this county; the last mining work was at the depth of eighty (80) feet; the mine material is a hard clay slate, with a small per cent. of disseminated iron pyrite; the ores are reputed good.

THE WYATT

is one-fourth ($\frac{1}{4}$) mile west of the above, and is probably part of the same vein.

THE HOWIE

is one and one-fourth ($1\frac{1}{4}$) miles northwest of the Washington; it has been extensively worked and to a depth of more than three hundred (300) feet.

The ore is quite like that from the Washington, but more quartzose, and has numerous seams of quartz, which generally are associated with the richer ores.

The yield of this mine has been estimated at \$750,000.

The ore body is more than one (1) mile long, coursing N. 60° E., and has been worked for nearly one-half ($\frac{1}{2}$) mile of that distance; the vein is four hundred (400) feet wide.

The schists are altered down to the level of standing water, and peroxidized, and the ore to that point is soft and easily treated; below the water line the ore is extremely hard. Sulphurets (iron pyrite) to the extent of one (1) per cent. are generally present in all the material mined.

Soft ores assay \$2.05, \$9.02, \$15.32, \$21.32, \$43.06.

Hard ores run from \$2.62 per ton to \$34.17, and as high as \$310.51. Large bodies of the rubbish pile contain \$3.26, tailings \$3.53.

Other parts of the tract show large bodies of soft clay-like auriferous material, which has been successfully treated; the whole formation is apparently auriferous, as well as the so-called veins.

The "Big Survey" lands come in between the Howie and the Davis, two and one-half ($2\frac{1}{2}$) miles to the northeast. The corporation owning this intervening tract has

done little to encourage mining, and there is in consequence scanty knowledge of its value in minerals.

At this point,

THE DAVIS LINE,

a remarkable series of mines commence, four (4) of which lie in regular succession from southwest to northeast, viz.: the Davis, Phiffer, Lewis, and Hemby. For the distance of one and a half ($1\frac{1}{2}$) to two (2) miles the course of this deposit is a series of shafts, for the most part shallow, but occasionally sunk as deep as one hundred and fifty (150) feet—e. g., the Davis. The whole deposit has been enormously rich, especially the Phiffer, where, on Mint Hill, an open cut has been excavated one hundred (100) feet in diameter, and fifty (50) feet deep. None of these are worked systematically. The Lewis has two (2) and possibly more veins; the Hemby has several—three (3) different series are reported. Assays are \$8.30 per ton to \$34.53.

MOORE HILL

is situated one (1) mile southwest of the Davis, and

FOLGER HILL

a half ($\frac{1}{2}$) mile west; this mine has been worked to a depth of ninety (90) feet.

THE HARKNESS

is a half ($\frac{1}{2}$) mile east of the Lewis; its greatest depth is one hundred and twenty (120) feet, where a fine quartz vein was found, showing free gold abundantly.

These deposits are in clay slate, with a chloritic or talcose tendency; the gold is in a free state for the most part, with a small proportion of sulphurets, and occasionally of galena.

One half ($\frac{1}{2}$) mile northeast is the

SMART.

This mine has been worked to a depth of seventy (70) feet, and a fine body of galena was reported to have been uncovered.

THE CRUMP MINE

near by is four (4) miles from Stout's Station, on the Carolina Central Railroad.

This mine was in active operation till the middle of the summer of 1885, when the buildings and machinery were destroyed by fire; it is now filled with water. It is noted for its remarkable pockets and splendid nuggets, in which form the gold usually comes.

Davidson County.

The mining work of this county was almost suspended in 1885, although several mines had been actively at work in previous years.

THE CONRAD HILL

mine is situated about seven (7) miles nearly east of Lexington. This locality has had a double history by reason of a divided ownership; the veins at their outcrop, and for a moderate depth to the east of the north and south dividing line, belonged to the old "Morehead

estate," and to the west of this line to another party. The old description and designation of "Conrad Hill" of thirty (30) years back apply to the former, the later use of the name to the westerly tract. The mine is now operated by the Conrad Hill Gold and Copper Company, of Baltimore.

The "country" of the mine is composed of quartzitic-argillaceous schists, though they resemble and are described as talcose.

There are seven (7) veins in this mining district, possibly eight (8), of which only five (5) outcrop, or if the others do the same, the evidence is obscure or obliterated.

Six (6) of the veins have been worked. All are bold and very marked in their characteristics, and of more than usual width, ranging in thickness from two (2) to eight (8) and, at points, to fifteen (15) feet; all are free from dislocation or other disturbances.

Five (5) of these, called north and south veins, course N. 10° to 15° E., and dip westerly; two (2), designated east and west veins, run N. 60° to 80° E., and dip southwardly.

The vein matter is quartz, the mineral matter yellow copper pyrite (chalcopyrite) with various copper minerals resulting from alteration, such as cuprite, malachite, melaconite, etc., and always auriferous; chalybite is a common accompaniment; the mine matter is remarkably destitute of all distinctive iron minerals, chalybite excepted; even iron pyrite is rarely met with. In the

upper zones the sulphurets were, for the most part, altered or peroxidized, but in the lower zones not much changed.

Financial derangements have brought about a discontinuance of all mining work for the present, but during the later and prosperous years the work was carried on by careful and systematic methods. The general course of metallurgical treatment is outlined below:

The mine matter was partly sorted out underground, and still further hand-cobbed and picked in the sheds; the richer ore was sent at once to the copper works; the residues after passing through a Blake crusher were jigged, and the best material added to the richer mine stuff above alluded to; the poorest material from the jigs was rejected, the medium grade sent at once to the stamp battery and amalgamated as usual; the tailings from the battery were partly concentrated by buddles and blankets, and the concentrates sent to the copper works.

At the outset the richer copper minerals were, after roasting, smelted in a shaft furnace for matter from which, after re-smelting, a black copper was obtained and refined.

This material, however, was not suited to this treatment, as the necessary basic matter was lacking to make a proper flux, and smelting was superseded by the wet method under the Hunt & Douglas patent.

In this process the crushed ore, after roasting, was subjected to a bath of protochloride of iron and leached; the copper was precipitated from the liquor by metallic

iron and refined. The residues, now mostly peroxides, were sent back to be milled, amalgamated and, to a slight extent, concentrated again. The final products were gold bullion and refined ingot copper.

The greatest depth reached in this later work was four hundred (400) feet.

SILVER VALLEY

mine is twelve (12) miles a little south of east from Lexington, and five (5) miles a little east of north from Silver Hill.

The prevailing formation is a silicious argillaceous schist. The contents of the vein is a milk-white and very barren looking quartz, which disclosed no mineral matter of value till a depth of sixty (60) feet was reached, though the upper part was not destitute of auriferous brown ore.

The presence of galena was suspected twenty-five (25) years before, and a great deal of prospecting work was undertaken to find it, but the shaft was sunk in the slates a long way to the west of the present shaft, where the galena disseminated in the schists seemed most promising.

The vein now described was found in 1880, and was reached only by a shrewd guess.

The outcrop of quartz is sometimes twenty (20) feet wide, but the vein below is five (5) to twelve (12) feet thick, with ore seams five (5) inches to five (5) feet; the vein runs a little east of south to west of north, and dips

westerly at an angle of about 45° ; the average width is thought to be twelve (12) feet.

It is laminated in structure, and has alternate bands of ore and slaty matter. The ore is sometimes massive, and sometimes so disseminated or mixed with the quartz that it will not dress down to more than one-fourth ($\frac{1}{4}$) to one-eighth ($\frac{1}{8}$).

The massive ore is cobbled out and hand-picked; the mixed material is milled in a twenty (20) stamp mill, and concentrated in buddles, blankets and launders, and latterly, by Rittinger tables. The latest recorded concentrating work is indicated in analyses IV and V, though better work has been claimed.

Analysis I more nearly represents the common run of the slightly cobbled ore, and No. III the massive ore; No. II is exceptional, and yet often met with.

The possibility of concentrating the mine stuff into a smelting product fairly free from zinc is shown in No. V, but the losses, as concentration has hitherto been practiced, are enormous.

The large per cent. of zinc has hitherto been the only difficulty in the way of an extensive employment of the valuable resources of this mine.

ANALYSES:

	I.	II.	III.	IV. Poor concen- trates.	V. Rich concen- trates.
Gold.....	Trace.	\$ 4.13	Trace.	\$ 4.13	\$ 4.13
Silver.....	\$13.30	150.15	\$32.45	9.58	38.06
Total.....	<u>\$13.30</u>	<u>\$154.28</u>	<u>\$32.45</u>	<u>\$13.71</u>	<u>\$42.19</u>
	per cent.	per cent.	per cent.	per cent.	per cent.
Lead.....	15.89	55.25	38.80	11.18	47.62
Zinc	31.44	11.24	32.00	27.70	12.68

The gold is far from being uniformly diffused, for the presence of a little iron pyrite makes a considerable difference in the gold contents.

THE WARD

mine, two (2) miles east of Silver Valley, has been sunk upon to a depth of eighty (80) feet; there are four (4) nearly parallel veins. This property has also a large amount of surface suitable for hydraulic treatment.

It received a very favorable notice from Prof. Emmons, the former geologist of North Carolina.

SILVER HILL

mine is five (5) miles a little south of west from Silver Valley, and ten (10) miles southeast of Lexington. It was at the outset known as the Washington mine, and is described in Emmons's report under that name; it has also been called the Davidson mine.

The country is an indurated clay slate, very silicious.

There are two (2) nearly parallel veins ten (10) to twenty-five (25) feet apart, and two (2) subordinate veins of less importance and apparently of limited ex-

tent, with some subordinate ore bodies, whose relations are not known.

The upper part to the depth of one hundred and sixty (160) feet has been carefully described by Emmons; of the lower part few records exist. The mine is entered by six (6) vertical, and by one (1) inclined shaft, but the main vertical shaft at the depth of 160 feet is changed to an underlay shaft in the east vein; the west vein below the 200 foot level is entered from the east vein by cross cuts.

The unaltered ore consists of galena and blende, always argentiferous, and to a slight extent auriferous.

The upper zone of ore in all the veins has undergone the usual transformations and peroxidization, with the result of leaving the gold and the silver in part free.

At the first the real character of the ore was not suspected, and the outcrop was worked for gold chiefly, with silver as an incidental. At a greater depth some of the most remarkable specimens of lead carbonates, phosphates, arsenates, and sulphates, etc., were obtained with interesting forms of native silver. These gave place to galena and blende before the depth of eighty (80) feet was reached, though even down to 160 feet the oxidized ore occurred in some quantity. At the depth of one hundred (100) feet the ores took on their normal unaltered character as shown in assays V, VI, and VII. The average composition of the ores at the depth of two hundred (200) feet according to Prof. Genth, at one time the company's chemist, was :

Galena.....	21.9	per cent.
Copper pyrite.....	1.8	“ “
Blende.....	59.2	“ “
Iron pyrite.....	17.1	“ “
Gold and silver.....	.025	“ “
<hr/>		
Total.....	100.025	per cent.
<hr/>		
Or,		
Lead.....	18.97	per cent.
Zinc.....	39.68	“ “
Copper.....	1.19	“ “
Average silver of 200 assays $7\frac{1}{2}$ ounces, gold small.		

The mine has been worked to depth of 725 feet on the underlay shaft, which is equivalent to a vertical depth of 600 feet.

Little is known of the ore bodies at this depth, though the chimney is known to exist in both veins, probably with smaller dimensions than in the levels above 200 feet; the ore is massive, and carries apparently fully as large a per cent. of zinc; its relative value in the precious metals is not known. Nos. V, VI and VII indicate the general character of the ore in depth.

The later exploitation of this mine was in the shallow part. An inclined shaft was sunk in 1878, cutting through some outlying bodies to the east of the old workings, and with the intention of cutting the back vein at the depth of 160 feet; a considerable body of “carbonates” was uncovered, but the grade was too low for profitable work. See Nos. I, II. Nos. III and IV are analyses of the iron pyrite.

The difficulties of treating this ore, as alluded to in the notice of Silver Valley, whose ores it resembles, are so

great, as to have precluded the use of them for general metallurgical purposes, for which, were zinc absent, they would be valuable.

ANALYSES:

Carbonates.		Iron pyrite.	
I.	II.	III.	IV.
Gold.....\$ 8.78	\$2.07	\$3.10	\$10.34
Silver.... 17.23	3.96	4.13	2.18
Total..\$26.01	\$6.03	\$7.23	\$12.52
Lead..... 3.8 per cent.	31.94 per cent.	.67 per cent.	
Zinc..... ..	27.28 per cent.	2.08 per cent.	

COMPACT GALENA.

V.	VI.	VII.
Gold....\$ 4.14	\$ 6.20	\$ 4.13
Silver... 2.75	9.17	9.55
Total..\$ 6.89	\$15.37	\$13.68
Lead..... 22.94 per cent.	56.72 per cent.	12.57 per cent.
Zinc..... 7.14 per cent.	.....	34.29 per cent.

THE WELBORN

mine, two (2) miles west of Silver Hill, has reached the depth of sixty (60) feet; ores, sulphurets, galena, and blende; assays for gold and silver are \$7.60, \$10.88, \$13.90, \$19.26, \$39.20.

THE SYMONS

mine is two (2) miles west of Silver Hill in the Cross neighborhood. The shaft is down forty (40) feet; the mine material is good brown ore. The machinery consists of a five (5) stamp mill.

THE DAVIDSON OR EMMONS COPPER

mine is now operated by the Consolidated Gold and Copper Mining Co., of Baltimore.

It is situated two (2) miles southeast of Silver Valley.

It was extensively worked for copper down to 1872, when it was abandoned; it was reöpened in the fall of 1885.

It is entered by two (2) shafts 680 feet apart, respectively 416 and 300 feet deep. The vein is six (6) feet wide and well defined; it is filled with quartz and slate, with chalcopyrite; the percentage of copper is not large, but the ore is readily susceptible of concentration to a high grade. The schists are deep green in color, and of a silicious and chloritic character, strikingly like those of Gold Hill.

The ore is valued chiefly for its copper constituent, and is not regarded as carrying much gold.

THE CID

mine, one and one-fourth ($1\frac{1}{4}$) miles northeast of the Emmons, is apparently in the same horizon, and the description of the one answers to that of the other, though it has been too little worked to allow of any statement of its permanency; the shaft is down one hundred (100) feet.

The other mines in this slate belt will be discussed under the heads of their respective counties, *e. g.*, Gold Hill, McMakin, and others.

The granitic axial area of North Carolina, extending from the northern boundary of the State southwest into South Carolina, has also a large number of mines.

The ore yielded by these mines is always auriferous, and occasionally also cupriferous; they are not known to carry more than trifling amounts of either lead, zinc, nickel or silver, the latter, where occurring, being associated and alloyed with gold.

In Guilford County.

the north extremity of this belt, the only mines at work are the Fisher Hill and the North State (McCullough).

The former is seven (7) miles south of Greensboro, and is operated by the Fisher and Willis Hills Mining and Smelting Co. It comprises a tract of 800 acres. The vein is extremely flat. The deepest shaft is down 106 feet, and a fine body of ore has been uncovered at the depth of seventy-five (75) feet, whose width is ten (10) inches to four (4) feet; already the explorations have exposed it to a length of fifty (50) feet; it is brown ore and sulphurets, milling \$30 per ton.

A second series of shafts, four (4) in number, have been sunk to the northwest on Willis's Hill, 150 rods distant from Fisher Hill; at the depth of 50 feet good pockets of brown ore have also been uncovered.

The milling plant consists of ten (10) stamps, with all necessary appliances for long continued and successful work.

THE NORTH STATE MINE,

under the North State Gold and Copper Mining Co., is two (2) miles south of Jamestown.

The vein runs nearly northeast and southwest and dips eastward nearly 45° . The shaft is down nearly 350 feet; the vein is four (4) to eight (8) feet wide. In the lower levels, where the work is most largely pursued at present, the ores are mostly sulphurets, sometimes massive, but more generally scattered in a quartzose gangue, and require a cobbing or other concentrating. The ores carry a small per cent. of copper, and are commonly of a good grade. They are shipped for treatment to the Davis Chlorination Works at Salisbury.

The mill has twenty (20) stamps.

THE HODGINS HILL

mine, one (1) mile north of Fisher Hill,

THE LINDSAY,

two hundred (200) yards southwest of the North State, and

THE JACK HILL

to the north, both continuations of the North State, are all idle.

THE DEEP RIVER MINE,

two (2) miles south of the Lindsay, is unworked, as is also .

THE FENTRESS,

or N. C. copper mine, two (2) miles northeast of the Fisher Hill; this mine has been worked to a depth of

310 feet, and at one time produced a high grade of copper sulphuret; it is believed that a large body of like character remains.

In Davidson County.

the mines in the slate belt, *e. g.*, Conrad Hill, Silver Hill, have already been described.

The only important mines in the granite belt are the Lalor, Eureka and the Black.

THE LALOR,

(formerly Allen) mine, is two miles south from Thomasville. It is not now operated.

It is entered by three (3) shafts, the deepest of which has reached a depth of 165 feet on the underlay.

The vein is reported of good width, and carries a fair percentage of copper.

The lowest grade brown ore is reported to assay \$20, and the highest grade sulphuret \$190.

THE EUREKA MINE,

one-half ($\frac{1}{2}$) mile west, is also idle. The depth of last workings was 125 feet; the vein is of good width; the ore is quite like the Lalor ore. Assays, \$25.19, \$41.47, \$46.51, \$73.55, up to \$1,890.

THE BLACK MINE

is immediately adjacent to the Eureka; the vein is small, but the ore has a high reputation.

Rowan County,

The only mines in this county at work in 1885 were, Gold Hill (Randolph, Old Field and Hunnicut veins), Dunn's Mountain, Holtshauser and Gold Knob.

The Yadkin (Davis) Chlorination Works were supplied from several mines along this belt.

No work of importance was done in 1885 at the

DUNN'S MOUNTAIN MINE,

four (4) miles southeast of Salisbury. The operations were chiefly confined to clearing out old shafts, in the expectation of extended works in 1886. Of the three (3) veins on the property only the "office vein" has been operated; this vein has turned out some very good milling ore; the mine material from the other veins was from such a depth that only sulphuretted ores could be expected, and they are slightly cupriferous.

AT THE REIMER MINE,

six (6) miles southeast of Salisbury, no work has been done since the burning of the plant in February, 1884. The depth of this mine is 150 feet. The chimney of ore was nearly 400 feet long, and four (4) to eight (8) feet wide.

At this depth the material was largely iron pyrite (pyrrhotite), of moderate value. Assays of ore were \$11.32, \$36.00, \$126.77.

THE YADKIN (OR DAVIS) CHLORINATION WORKS, one and a half ($1\frac{1}{2}$) miles south of Salisbury, was in active operation in 1885. Heretofore the ore supply

has been taken from its own mines—the Yadkin and the Reimer—but the destruction of the concentrating machinery of the latter has compelled the manager to seek a supply from other sources. The works have chiefly been run on material from the North State, the Rudisill and the Saint Catharine.

The establishment is operated under the Meares chlorination patent, the marked feature of which is chlorination under pressure.

The essential points of this method are in outline—the crushing of the ore to pass through a forty (40) to sixty (60) mesh screen, roasting in reverberatory furnaces of the common type, chlorination in a tightly-closed revolving Freiberg barrel, leaching of the chlorinated mass, and filtration of the auriferous liquor through a filter of fine charcoal to eliminate and absorb the gold, the careful burning of the charcoal and melting of the ashes containing the gold.

The barrel is an iron cylinder lead-lined; the chlorination is accomplished by chloride of lime and sulphuric acid, the pressure being effected by the chlorine gas, which is liberated.

AT THE DUTCH CREEK MINE

a very little work was performed, though the resources are promising.

This group of mines is on the waters of Dutch second creek, ten (10) miles east of Salisbury, on the Stokes ferry road. The superintendent reports twenty-two (22) veins on the property, two being copper-bearing.

The main development is on Hill, Tiptop and Katie veins, which afford a good supply of brown ore down to the water level and are in width from one (1) foot upwards, and, where the Hill and Tiptop cross, eighteen (18) feet wide. The shafts are down 110 feet. The adits and levels aggregate 1,000 feet. The ore varies in value from \$10 to \$30. The copper veins are down respectively fifty (50) and forty (40), and are three and a half ($3\frac{1}{2}$) to four (4) feet wide. The ore is of good grade, both as to copper and gold.

THE GOLD KNOB MINE

was slightly prospected in 1885, and no force was kept constantly at work. A five (5) stamp mill is run in connection with the mine. Sixty (60) feet is the greatest depth reached in any of the veins, of which there are eleven (11) on the various tracts owned by the company. The production was very small. The ore is abundant, and heavily sulphuretted, assaying \$20.68, \$26.62, \$27.38 and \$108.55.

THE ATLAS AND BAME

were not in operation in 1885.

IN THE GOLD HILL DISTRICT,

the only work done in 1885 was in the Gold Hill mine on the Randolph or western vein, and in the Old Field vein, and in the Hunnicut vein.

THE HUNNICUT VEIN

was leased during the greater part of 1885 to a local company of miners, and the work was pushed very vig-

orously till the expiration of the lease. A fine body of ore was raised and milled in a Howland mill attached to the mine.

A little work was done in the Randolph shaft (740 feet) and on the 280 foot level, and in the Old Field vein at 130 feet, but the ore was not milled. This mine is now controlled by a London company, and the home business of the company has not been favorable; consequently the work has not been pushed at the mine.

This, the most noted mining district in North Carolina, is fourteen (14) miles southeast of Salisbury in the southeast part of Rowan county, and extends southwest into Cabarrus, and to a slight extent into the northwest part of Stanly. It is situated on the narrow plateau of a low lying northeast and southwest ridge. The number of veins is commonly estimated to be ten (10); this group with its connections is one and one-half ($1\frac{1}{2}$) miles long from northeast to southwest, and two-thirds ($\frac{2}{3}$) of a mile wide from northwest to southeast.

The district is one (1) mile east of the granite, and is in close contact with a diorite group on its east.

The prevailing type of formation is chloritic argillaceous schist, the chloritic element being more marked at the northeast end, and the argillaceous at the southwest.

The striking characteristics of this district are the great permanency of the veins both in depth and extent, and their freedom from disturbances, and the variety and richness of the ores. I believe there were no bold out-

crops, and in some cases (*e. g.* the Randolph) they were so obscured and covered, that they were only discovered by accident, and at a comparatively late date in the history of the mines of the State.

The more noted veins are the Randolph, Barnhardt, Hunnicut, Open Cut copper vein on the Standard property, the Trautman gold vein, and the McMakin silver vein. But closely associated with each large vein are outlying bodies, which may also be independent veins, *e. g.* the Old Field body, which is between the Barnhardt and Hunnicut, and is made up of several nearly parallel—six (6)—bodies of ore, which are very narrow and intercalated with slates.

THE RANDOLPH,

almost, if not quite, the extreme northwest vein of the group, has been worked more or less for a length of 1,500 feet, and to a depth of 740 feet; there are three (3) principal shoots of ore extending to the greatest depth to which the mine has yet been worked. The Randolph shaft (740 feet) passed through the Texas shoot, and just cuts the north edge of the Big Sulphur shoot, and is but a few feet distant from the Randolph shoot.

Little exploratory work has been done at the bottom of this shaft, and little can be said of the shoots, or the quantity or the value of the ore; at this depth the ores are entirely sulphuretted, mostly iron pyrite, but with enough copper pyrite to give a copper contents of two (2) per cent.

THE BARNHARDT VEIN,

400 feet east of the above, has been equally exploited to a shallow depth, and down to 100 feet; below 100 feet the works have extended only 400 feet along the vein; the ores are like those of the Randolph, but less cupriferous.

Both of these veins will probably afford a large quantity of ore, which can be treated advantageously only by a preliminary concentration.

THE OLD FIELD VEIN,

to the southwest of the main workings of the Barnhardt, and quite near to them, consists of a series of strings (veins) of ore intercalated with the schists; these seams are frequently of great richness, but the gold "jumps" from one seam to another so often as to give some embarrassment in mining.

The depth of 130 feet has been reached.

The body of cupriferous mineral still further southwest on the

STANDARD PROPERTY

was worked mostly by open cut. The vein consists of several narrow belts of talcose schists charged with mineral matter, altered to gossan in the upper zone, and sulphuretted in depth; this body is sometimes sixty (60) feet wide at the depth of twenty (20) to forty (40) feet, but at greater depths the ore body tends to concentrate, and becomes only thirty (30) feet.

The deepest workings were eighty-four (84) feet.

THE TRAUTMAN GOLD VEIN

is the least known of the more prominent ore bodies.

Down to twenty (20) feet the ores are an auriferous porous quartz with limonite; twenty (20) to sixty (60) feet down a mixture of hematite with highly ferruginous quartz, with a little crystallized pyromorphite, cerussite and other lead minerals; lower down auriferous pyrite and quartz. The ores are frequently rich in gold.

THE MCMAKIN MINE

is the extreme southwest of the vein of this system, and like the Trautman mine, is mostly in Cabarrus county.

It has been exploited by pits for several hundred yards, but the deep workings have extended over a linear distance of about 200 feet. The lowest level is 111 feet distant. In addition to the main body of ore there is a "small or west" outlying vein eleven (11) to fourteen (14) feet distant. The outcrop was hematite, dolomite, and various manganese ores, the latter disappearing at twenty (20) feet; lower down plumbago, cerussite, pyromorphite and other plumbiferous matter appeared, and at sixty (60) feet the unaltered minerals came in, viz.: blende, galena, iron pyrite, copper pyrite, and highly argentiferous tetrahedrite—blende predominating with a slight admixture of galena and tetrahedrite.

At greater depths blende gradually disappears, and tetrahedrite becomes more abundant. The width of the vein at 75 to 100 feet ranged from four (4) to ten (10) feet.

The importance of such rich galena will be manifest, when good metallurgical establishments shall be at work in this section.

It may be well here to call attention to the large number of veins in the southeast part of Rowan county, and the adjacent parts of Cabarrus and Stanly counties. To the industry of T. K. Bruner, Esq., Dr. Rumble and J. J. Newman, Esq., we owe good maps and sketches of this part of Rowan county. These and the data prepared by Mr. Bruner show more than a hundred mineral localities here, and as many more in the adjacent parts of Cabarrus and Stanly counties. Of most of these we know little, as the surface of the country is so rugged as to make exploration difficult, but there is little doubt that these hidden stores will some day play an important part in the developed resources of North Carolina.

Cabarrus County.

There is at present less activity in mining in this county than in former years; the only mines now operated, of the sixty (60) or seventy (70) in this county, are the Phoenix, North Barrier, Joel Reed, Rocky River, the Reed and the Clay.

Nearly all the mining localities are within two to four miles of the east boundary of the county, and lend themselves with facility to an arrangement by mining districts, of which there are four (4) of importance, viz.:

1st. The Gold Hill group.

2d. " Rocky River group.

3d. " Phœnix group.

4th. " Pioneer Mills group.

Of these the first two (2) are in the slate formation, previously described as the Davidson county belt; the third and fourth are in granite; all are near the contact.

The mines in the Gold Hill group have been for some years entirely neglected.

THE JOEL REED MINE,

near Concord, has been operated only at intervals, and no great depth has been reached, but the returns have been amply remunerative for the amount of work given to it.

THE QUAKER CITY MINE

is down eighty (80) feet. The ores were sulphuretted and refractory, and operations were suspended. The mill was on Buffalo creek, three (3) miles from the mine.

THE PHŒNIX MINE,

seven (7) miles a little south of east from Concord, has been worked for many years with great vigor and skill, both in the mining department and in the metallurgical establishment connected with it.

The mine is entered by four (4) underlay shafts, one to a depth of 365 feet; from this shaft levels have been driven both northeast and southwest, and a good body of ore developed, three (3) to three and a half ($3\frac{1}{2}$) feet wide. Assays show this to be of good quality, separating easily into two (2) grades—the best \$40 to \$67.14, and the poorer \$10 to \$16.88.

Hardly any sloping has been done below the 250 foot level, and the reserves are as large as at any time in the past.

The chlorination works are of the capacity of eight (8) tons per day. The plant was constructed to work under the Meares' patent, but so many changes have been made, that it can now hardly be designated by that name. The establishment is quite complete, consisting of a battery of ten (10) stamps, two (2) Frue vanners, four (4) horizontal rotary furnaces for roasting, four (4) barrels for chlorinating, leaching and precipitating tanks. The ores are generally cupriferous to a slight percentage, and a small amount of cement copper is produced after the removal of the gold.

THE NORTH BARRIER MINE

has been worked to a depth of seventy-five (75) feet, but operations have been confined to mere explorations.

THE TUCKER MINE

has not been worked to any extent since the preparation of the Hand-Book of 1883, and the statements there made will apply now, though there is more and better machinery there now.

THE ROCKY RIVER MINE,

of 350 acres, is ten (10) miles southeast of Concord, and one (1) mile from Bost's mill.

The mine is consolidated from the Jake Shin and the Tom Shin mines.

There are seven (7) veins in this tract, of which only three (3) have been worked to any extent.

Five (5) shafts have been sunk ranging from thirty-eight (38) to fifty-five (55) feet in depth; veins range in width from two (2) to five (5) feet. There is frequently sufficient galena in the ore to enrich it appreciably in its precious metal contents.

The ores are from fair to high grade, assaying \$17.05, \$6.05, \$48.66, \$67.70, \$62.94.

THE REED MINE

is ten (10) miles southeast of Concord.

There are four (4) veins on the property besides alluvial deposits. The gravel or surface part of this mine is not worked at present, but for some months one of the veins has been drifted on, and a splendid chimney of quartz has been developed, whose richness is apparent to the most casual observer; the work at present is at the depth of sixty (60) feet.

This mine was the first to give celebrity to the gold fields of the Appalachian Range, though probably not the first to yield gold. The first nugget was found here in 1799; the largest nugget, twenty-eight (28) lbs avoirdupois, was unearthed in 1803; regular mining work commenced some years later, and for a period of forty years continued to send forth its golden stream.

The proportion of large nuggets has not been paralleled on this side of the country, though the Sam Christian has had a similar history, as also the Parker mine. The Reed, unlike them, has large underground resources.

THE CLAY MINE,

near Pioneer Mills and twelve miles southeast of Concord, has been operated at intervals only, but with fair returns for the work expended.

THE ALLEN FURR MINE,

twelve and one-half ($12\frac{1}{2}$) miles southeast of Concord, shows a large amount of massive iron pyrite with a little galena; the size of the block would seem to confirm the general belief that the vein is a wide one—four (4) to eight (8) feet. Depth of workings fifty (50) feet; the material is very refractory, and this fact coupled with its high contents in pyrites (including a trace of copper pyrite) and its rather low tenor in gold and silver, makes the problem of its treatment a difficult one.

Assays \$48.10, \$35.27, \$7.37, \$7.24.

The *Salisbury Watchman* enumerates about fifty (50) other mining localities in this county.

Mecklenburg County.

Five (5) mines are in operation in this county—the Henderson, the Frazier, the Baltimore & North Carolina (Ray), the St. Catharine, the Rudisill and the Harris or Surface Hill.

THE HENDERSON,

eight and one-half ($8\frac{1}{2}$) miles northwest from Charlotte, has been simply prospected and some of the ores shipped; no great depth has been attained, and there is no machinery for treating the ores.

Assays have been \$72.98, \$64.67, \$14.35.

THE FRAZIER MINE

has been worked to a depth of eighty (80) feet and a vein of good ore uncovered one (1) to one and one-half ($1\frac{1}{2}$) feet wide; at this depth the ore is largely free milling, though unaltered sulphurets begin to appear in quantity. The ore was treated at the Rudisill mine mill.

Assays: \$186.68, \$50.27.

THE BALTIMORE AND NORTH CAROLINA PROPERTY is also known as the

RAY MINE.

There are five (5) veins on this tract of 360 acres, of which only one is now worked—the Ray vein. It is situated nine miles southeast of Charlotte, and near the Carolina Central railroad.

This vein is entered by six (6) shafts, the deepest of which is about 150 feet; the ores are now heavy sulphurets containing some copper.

The total length of veins on this property is about four (4) miles. The south vein has been sunk upon to a depth of sixty (60) feet, and the Phifer Grove vein forty (40). In neither of these had the works penetrated below the level of free ores.

This mine is fully supplied with machinery and all milling appliances. The battery has ten (10) stamps. Assays, \$20.95, \$31.82, with generally a good per cent. of copper.

The lowest point reached in the

ST. CATHARINE

is 350 feet, and the work has been carried on with great vigor for some years. Both of the veins have been worked. The ores now are almost exclusively sulphurets, but they invariably carry a large amount of free gold.

As soon as brought to the surface they are cobbled and hand-sorted into a high grade of shipping ore for smelting works, and of a low grade for mill treatment on the grounds. The machinery consists of a ten (10) stamp battery, with two (2) Frue vanners for concentrating the tailings. The concentrates are generally sufficiently rich to justify shipping.

The products are a high grade bullion and a high grade of smelting ores and concentrates.

THE RUDISILL,

one (1) mile southwest of Charlotte, has been sunk upon 400 feet.

The "Bush Hill" end of the mine, adjacent to the St. Catharine, was reöpened in the latter part of 1885, but the work is not advanced enough to justify any conclusions as to the value of the vein here.

Much of the mining work has been done in the shallower levels of the old part of the mine above the two-hundred (200) foot gallery, where, at present, high grades of sulphurets are found in quantity.

Concentration by cobbing and hand-picking is practiced to obtain a grade of smelting ore, and the residue is milled, and occasionally the tailings are concentrated on Frue vanners or other machinery.

The milling is done by a Wiswell mill, a recently introduced machine. Electro-galvanic action is sometimes employed in connection with it, but this feature of the reduction has not been successful here thus far.

Ores assay: \$6.20, \$11.47, \$21.79, \$30.42, \$39.66, \$61.43, \$91.89, \$129.18, \$178.39. Entire shipments will average \$100 to \$175 per ton.

THE HARRIS MINE

is ten (10) miles nearly east of Charlotte. The stretch of mining property upon which this mine is situated is known to have rich gravel. Surface Hill, one of these localities, is famous for its rich nuggets, and occasional pockets of ore are found of extreme richness. The locality is badly situated in point of water supply; otherwise the rich gravel would be worked.

Of the numerous mines of this county not now worked, the following brief notices may be made.

THE MCGINN MINE,

five (5) miles northwest of Charlotte, has three (3) veins, two (2) carrying the gold ores usually found in this section, the third having rich copper as well as gold ores. The copper vein has been mined to a depth of 165 feet, and a remarkably rich chimney of copper ores exploited.

The more prominent of the two (2) gold veins (the Jane) has been penetrated to a depth of 150 feet, and worked with some success as deep as the machinery could command the water.

Ore assays have been \$4.37, \$12.50, with $4.\frac{55}{100}$ per cent. of copper, \$15.72, \$6.82 with $7.\frac{50}{100}$ per cent. of copper, \$82.77, \$114.36, \$137.93.

The Jane vein runs at its south end into the

CAPPS HILL PROPERTY,

where it is joined by the prominent vein known as the

CAPPS VEIN.

The system has been worked to a depth of nearly 200 feet, but the later work was performed above the 130 foot level.

The Jane vein has furnished good bodies of ore, but the reputation of the property has been founded mainly on the Capps vein. This vein is unusually large, and has given three large chimneys of ore, besides several smaller bodies. It is among the largest producers of the county if not indeed the largest, being credited with a yield of \$2,000,000.

Two (2) of the chimneys are known to reach the depth of 130 feet, but that level had not been sufficiently extended to cut the third.

At this depth the ores are mostly heavily sulphuretted, and a large dump of rich iron pyrite is accumulated.

Assays \$7.10, \$56.35, \$96.37, \$133.00, \$133.76.

THE CLARK MINE

has been worked to a depth of seventy (70) feet. There are two (2) veins.

The ores assay, \$8.34, \$16.76, \$33.25, \$67.25, \$74.71, \$126.69, \$164.44.

THE SMITH AND PALMER MINE

has not been worked to any notable extent since the preparation of the Hand-Book of 1883. Shaft down 100 feet, and levels driven; ores assay, \$4.66, \$15.51, \$72.34, \$149.59.

THE FERRIS (FAIRES) MINE,

six (6) miles northeast of Charlotte, is a prominent mining property, with three (3) veins.

The assays of ores, \$20.14, \$10.34, \$28.94, \$44.32, \$111.16, \$128.66, \$220.54 and \$512.94.

THE SIMPSON MINE

yields quartz ores, with little sulphurets. No work has been done here for four (4) years. Assays of representative lots have been \$3.79, \$4.75, \$7.37, \$29.97, \$70.87. As a rule the ores of this mine are of low grade, but the vein is large, and capable of yielding large amounts of milling material.

THE STEPHEN WILSON MINE

has ten (10) well-defined veins; it yields ores of values indicated as follows: \$4.52, \$11.37, \$36.56, \$51.50, \$97.53, \$261.76, \$355.96.

THE BLACK MINE

has a vein of the richest sort of brown ore, and large lots of it have milled \$50 per ton; assays of the same have run \$50.16, \$62.00, \$488.12.

Other mines in the county are:

The Arlington Guarantee, five (5) miles west of Charlotte.

The Carson, Sam Taylor, Tayhorn, southwest of Charlotte.

The B. F. Wilson and R. McDonald, one and one-half ($1\frac{1}{2}$) miles southeast.

The Davidson group, 1 mile west—a very prominent series.

The Trotter,

The Dunn, nine miles west, with three (3) veins, one (1) with copper.

The Hipp and Todd are near the Frazier.

The Chapman is to the northwest.

The Huntersville, sixteen (16) miles north of Charlotte, has been explored to a depth of twenty-three (23) feet, found to carry some good ore.

The Hunter, Crosby & Rogers are twelve (12) to seventeen (17) miles northeast of Charlotte, towards Pioneer Mills; these three (3) mines carry copper as well as gold.

The Nowell, the Pharr and other mines are near by.

The Johnson, Stinson, Maxwell and Rhea are seven (7) to nine (9) miles east of Charlotte.

The Alexander is five and one-half ($5\frac{1}{2}$) miles northeast, and the Caldwell six (6) miles.

The farm of the Elliott Bros., five (5) miles south of Charlotte, has several veins, one of which is rich in a very high grade of copper ore.

The Nolan, Means, Bennett, Cathy, the G. C. Cathy, Sloan, Gibson, McCorkle, and several others are within easy reach of Charlotte.

The Trediwick is seven (7) miles east, one and one-half ($1\frac{1}{2}$) miles southwest of the latter mine, and in the vicinity of Sardis church is a group of veins, of which only one has received a name—the Hunter—and only two (2) have been explored enough to afford any useful information; the two veins are about fifty (50) rods apart. No great depth has ever been reached in these veins, although the ores have generally been of good grade.

None of the metallurgical establishments about Charlotte have been successful, and none is now at work.

THE GNEISSOID FORMATION

extends westward from the granite area into Tennessee; the character of this area was outlined in the introduction.

Gaston County.

The only mines at work are the King's mountain, Duffie, and the Rhodes.

THE KING'S MOUNTAIN MINE

near the village of the same name, is now in the hands of a new company, which, during 1885, merely tested some bodies of ore hitherto little known. The main part of the mine is still filled with water.

The main shaft of this mine has reached the depth of 332 feet. The vein (or front and back vein, as it is

commonly spoken of) is of great thickness, sometimes reaching to forty (40) feet: the front vein has generally been the richer; assays run from \$3.55 to \$11.84, \$16.79 and \$45.94.

The vein is in limestone; its great width, the ease with which it is worked and milled, and the small amount of sulphurets (about three (3) per cent.) combine to make even the low grade material profitable ore to treat. The mill has forty (40) stamps.

A yield of \$750,000 is attributed to this mine.

THE CALEDONIA (OR CROWDER'S MOUNTAIN MINE) is three (3) miles southeast of King's mountain mine, and on the east side of the mountain. This body of land comprises 1500 to 1600 acres.

The veins are simply parts of the formation more highly auriferous. There are several of these belts on this extensive property. The gold seems to be associated in the gneisses or schists with a small percentage of iron pyrite, and to a less extent with copper pyrite.

THE PATTERSON MINE,

of like character, is one-fourth ($\frac{1}{4}$) mile northeast of the above.

Neither of these mines has been operated for several years.

One-half ($\frac{1}{2}$) mile still further northeast is the

CROWDER'S MOUNTAIN BARYTES MINE,

(or Stamford Manufacturing Company's mine). A very small amount of barytes was shipped in 1885.

THE DUFFIE MINE

is near Mount Holly on the Lincolnton railroad. It has been worked to a depth of 150 feet. A large body of sulphurets is found in this mine, assaying: \$5.79, \$12.95, \$8.31 to \$47.37.

THE ROBINSON MINE

adjoins the Duffie, and is of a similar character.

THE RHODES' MINE,

on the south fork of the Catawba, near Dallas, has been worked a very little in 1885.

There is no vein properly, but the whole body of micaceous schists or gneisses, now much altered, is auriferous.

THE LONG CREEK PROPERTY

has three (3) veins—Long creek, Dixon and Asbury. The ores of these mines are generally of low grade. Assays of Long creek ores are: \$4.14, \$10.34, \$21.94, \$821.84.

Other mines in this county on same formation are the Oliver, Rhyne and Burrell Wells.

. Lincoln County.

No mines were worked in this county in 1885.

There are but few gold mines in this county. Prominent among those which have been worked are the Hoke and the Burton.

THE HOKE,

four (4) miles from Lincolnton, has been opened to a depth of 110 feet, and drifted upon for some length. Ores assay \$17.09 to \$95.32.

THE GRAHAM MINE,

four (4) miles northeast from Iron, has been prospected to the depth of thirteen (13) feet, by pits along about 100 feet of the outcrop; the vein is thirty (30) inches to forty-two (42) inches thick. Assays \$18 to \$35, and \$89.74; the ores always contain a little copper, and occasionally the material becomes a veritable copper ore.

Catawba County.

The Shuford was the only mine worked. This mine is slightly south of east from Catawba Station, four and one-half ($4\frac{1}{2}$) miles.

The mining tract contains 425 acres, but the mining part embraces only twenty (20); this area is covered with auriferous quartz, and the soil is also auriferous; the underlying schists or gneisses are penetrated with seams and veins of quartz, generally gold-bearing. The mine is of that class which can only be worked by hydraulic methods, at least as a preliminary; its essential features are those practiced in Georgia, viz.: the washing down of the soil by a stream of water under a heavy pressure into sluices where a part of the gold is saved, and thence to a mill (stamp-battery) where the quartz is subjected to crushing and amalgamation. The

supply of water is always the most important consideration in work of this nature; at the Shuford the supply is not so large as could be desired.

Later work has been almost exclusively devoted to the veins in depth—work which is conducted after the usual modes of underground mining.

THE A. D. SHUFORD MINE,

three-fourths ($\frac{3}{4}$) of a mile to the southeast, was not worked in 1885, nor were there any operations within the writer's knowledge in any other localities in this county.

Davie County.

In the gneissoid formation in Davie county are several localities where gold has either been mined or found in some quantity. The only prominent mine is

THE BUTLER (OR COUNTY LINE) MINE,

eight (8) miles southwest of Mocksville. No work is done there at present. The only assays of ore are \$8.27 to \$8.75 per ton, but occasional masses are met with much richer.

CALLAHAN MOUNTAIN

was worked a generation ago; results are unknown.

THE ISAAC ALLEN MINE

is one (1) mile northwest of Mocksville.

There are deposits of gold in Clarksville Township, seven and a half ($7\frac{1}{2}$) miles northwest of Mocksville; also seven (7) miles northeast, in Fulton Township.

THE BARNES MINE

is eight (8) miles west of Taylorsville.

Ashe County.

THE COPPER KNOB MINE

(formerly Gap Creek) is situated in the southeast part of Ashe county, and fourteen (14) miles southeast of Jefferson; the tract contains 210 acres; the deepest underground work is 135 feet; the vein is twenty (20) inches to forty-two (42) inches wide. This mine has afforded the finest kind of peacock copper ore, and is sometimes more valuable for its copper constituent than for the precious metal.

It is one of a group of mines, but none of the others have been explored, with the exception of Rich Knob, two (2) miles distant. Assays are as follows: \$60.27, \$10.88, \$166.37 and copper $37\frac{44}{100}$ per cent., \$61.45 and copper $23\frac{82}{100}$ per cent.

Dressed ore has been obtained carrying gold and silver \$79.75 and copper $37\frac{5}{10}$ per cent.

This mine has not been operated for four (4) years, and is so deeply in legal difficulties that no prediction can be made respecting its future course.

Caldwell County.

The mining work done here in 1885 was extremely desultory, and the results very small; it consisted of gravel mining exclusively.

There are but few veins in Caldwell, at least that are known to the general public.

Twelve (12) miles north of Morganton, and on the northeast side of Johns river, is the

BAKER MINE.

Two well-known veins are on this property—a gold vein and a galena vein.

The gulches leading up to this mine were rich and extensively worked, and are still worked on a small scale.

The galena vein is reported to carry a large amount of galena, rich in gold and silver.

Other mines in this neighborhood are the Michaux, Pack's Hill and Corpening.

Burke, McDowell, Rutherford and Cleveland Counties.

The gravel area of the Upper Laurentian, where these counties come together, is fifteen (15) to twenty (20) miles long from northeast to southwest following the general direction of the mountain ranges, and from ten (10) to fifteen (15) miles wide. It barely touches the northwest corner of Cleveland county.

The Polk county deposits, some twenty-five (25) miles southwest, form probably the extension of this area.

Gold occurs over the intervening space in Rutherford county, but little is known of its value for mining purposes.

Almost everywhere in the limits indicated gold is found, but not always in paying quantities, for there are belts within the large belt. Of these narrow belts in the broad belt of these four (4) counties there are three (3)

fairly well-defined (for exact limits cannot be given where the entire formation is auriferous).

THE FIRST OR RUTHERFORD BELT

is in the extreme northeast part of that county, and just touches the county of Cleveland; it is on the head-waters of the First Broad; this belt is four (4) miles long and one (1) to two (2) miles wide; Golden Valley is the central point.

Two and one-half ($2\frac{1}{2}$) miles to the northwest is the famous

BURKE COUNTY BELT,

with Brindletown for its main point. This belt is probably not more than one and one-half ($1\frac{1}{2}$) miles wide; it commences, as far as paying gravel indicates a commencement, at Bailey's creek six (6) miles southwest of Morganton on the road to Rutherfordton, and continues parallel to the main chain of the South mountains, and on the spurs projecting out of its northwest side, for ten (10) or twelve (12) miles to the head-waters of Cane creek.

THE THIRD OR McDOWELL BELT

is four (4) miles to the west, and has for its centre Hunt's mountain and Nichols' mountain; it is probably two (2) miles wide.

It is situated on the head-waters of North Muddy creek, and of the Second Broad river, and is for the most part on the east of the road from Marion to Rutherfordton.

This region, in common with the whole of the Carolinas and Georgia, has undergone extensive alterations and decomposition, and subsequent wearing or drifting down, by which the gold has been left in the surface soil, and more largely in the bottoms of streams both ancient and modern. The old streams and sinks receiving the ancient drift and wash are the richest repositories.

They are usually of no great length or breadth, but oftentimes quite numerous.

It will readily be understood that the operations of the past, when little capital was employed and little apparatus, were necessarily confined to such deposits as lay near water, or to which water could be easily brought.

The greater part of these accessible places was long ago exhausted, and the work of the future will be on those deep-lying gravels, which require expensive digging to remove the overlying soil, or else a heavy and powerful stream of water to wash it away. The possibilities of remunerative work from the washing of gravel alone are growing less, and the attention of the chief operators is directed to a combination of the hydraulic and mill treatment. This surface to a great depth is altered and softened, and readily yields to water. The veins will not generally allow of exploitation one by one, as in ordinary mining, as they are too narrow, but a treatment of the entire ore channel as a whole is frequently applicable. When the conformation of the ground admits, and the gulches are deep enough, the

whole formation including many seams (or veins) of quartz may be easily undermined to a great depth, and the whole mass washed down into sluices, and thence to mill for battery treatment and amalgamation of the auriferous quartz and hard masses.

This combination is already employed at several localities, and will no doubt ultimately be largely extended.

Occasionally, veins of moderate width or even narrow seams can be profitably exploited in the common way by adits from the gulches entering at points so low as to make expensive hoisting and draining plants unnecessary; gravity tramways can often be constructed to place the ore in the mill-house with scarcely any handling.

The surface in this belt is very rolling, if not mountainous, and affords opportunities for novel combinations at once efficient and economical.

The foregoing statement respecting the occurrence of the auriferous bodies applies very generally to all the localities, though all have minor differences.

IN THE FIRST OR RUTHERFORD BELT,

the best known localities are: the Grayson—gravel and vein mine of 250 acres; it has several distinct veins of low grade auriferous quartz.

THE LAWSON SMART MINE,

gravel, of 500 acres, is one (1) mile north.

THE GAMBLE MINE,

gravel, is two (2) miles southwest; 126 acres are in the tract.

THE MCCURRY MINE,

near the Lawson-Smart, has both gravel and veins.

None of these are now operated to any extent.

In the second or

BURKE BELT,

the following are the most noted mines:

THE HANCOCK MINE,

near Glen Alpine. This is worked as a gravel mine.

THE GLEN ALPINE,

near the hotel of that name, is also a gravel mine.

THE CAROLINA QUEEN,

one (1) mile southwest of the Springs, is both vein and gravel. The last work was upon the veins; there is a battery on the premises.

J. C. MILLS,

at Brindletown, is in the very heart of the most productive part of the belt. His mining tract contains 2,500 acres. This large stretch embraces auriferous deposits of various kinds; gravel is abundant, and there are many veins easily exploitable. The mining here is very skillfully done, but to a far slighter extent than its resources warrant. Mr. Mills has made some effort to exploit the veins as well as the gravel.

In the

THIRD OR McDOWELL BELT,

the only localities now at work are those of the Vein Mountain Company and the Granville Company.

THE VEIN MOUNTAIN COMPANY

are at work on their property of 6,000 acres at Nichols' mountain, eleven (11) miles south of Marion, and at Hunt's mountain, four (4) miles northeast of Nichols' mountain.

Water is brought to Vein mountain in the company's ditch from the upper branches of the Second Broad river.

The gulches about this mountain, though worked for forty (40) years, still yield their rich contents.

So far, only hydraulic work has been done, but not to the extent which this important locality would justify. During the last three (3) years many veins have been discovered and prospected. Within a few months a ten (10) stamp mill has been erected to treat the quartz from these veins and from the gravel. The supply is apparently abundant for a still larger plant.

The quartz assays: \$2.18, \$4.13, \$6.20, \$10.33, \$13.43, and occasionally above \$25.

THE NORTH OR HUNTSVILLE MOUNTAIN

tract has been less prospected, but abounds in rich gravel. A difficulty in supplying this area with water has prevented the vigorous prosecution of the work here. An increased supply in 1885 admitted of some new work, and resulted in the discovery of some unexpected and

very rich gravel. The veins on this tract have never been fully examined.

Very little work was done at the Hard Bargain tract, one-half ($\frac{1}{2}$) mile west of Nichols' mountain.

AT THE GRANVILLE MINE,

two (2) miles northeast of Nichols' mountain, a little work was done in the latter part of 1885, under the Marion Bullion Company.

Polk County.

In Polk county the only work done in 1885, outside of petty gravel-washings, was accomplished by the Collinsville Mining Company, near Sandy Plain, in the southeast part of the county. Vein mining is carried on at several mines controlled by the company, and the ore was treated in the company's mill at Collinsville.

AT THE DOUBLE BRANCH MINE

very little work was done. The quartz is rich and will assay well—\$2.07, \$9.30, \$33.77 and \$466.28.

About twenty (20) localities are known in this county, extending fifteen (15) miles in a direction nearly across the belt.

THE PRINCE MINE

is four (4) miles south of the Double Branch. It is purely a surface mine, and the work is entirely hydraulic.

Other localities are the Patty Abrams, Wetherbee, Red Springs, Tom Arms, Splawn, Ponder, Riding, L. A. Mills, Carpenter, Hamilton, Neal and MacIntire. These all had a good reputation in the palmy days of

mining, while the deposits contiguous to water lasted; but at present none can be worked on a large scale without a larger supply of water than can be afforded from the vicinity of the mines. A sufficient supply could be obtained only from the North Pacolet, in the southwest part of the county, by a ditch twenty (20) miles long.

The geology of this county is like that of Burke, McDowell and Rutherford, previously described, but being much flatter it is lacking in those natural advantages for cheap mining.

Granville and Person Counties.

The area of auriferous and argentiferous copper mines of these counties is so remote from the well known mining region, that its connection with any belts cannot be fully established; its geological associations are similar to those of the eastern belt of Montgomery and the western of Moore.

The district is from five (5) to seven (7) miles long, from northeast to southwest.

Six (6) localities in this district are well known, viz: The Big America mine, the Copper World, the Holloway, the Gillis and the Yancey.

THE BIG AMERICA MINE,

in Granville county, one (1) mile from the Person line, and two (2) miles south of Virginia, has reached a depth of 65 feet; the shaft is an underlay and is in the body of ore; a drift has been run in the vein for 75 feet. The ore body is from one (1) to four (4) feet wide,

consisting of bornite, malachite, etc.; very little chalcopyrite is found. Several carloads of ore have been shipped to northern smelting works, ranging in contents: copper 21.27 per cent., and silver \$4.95, to copper 50.5 per cent.

The ore is reported free from arsenic, antimony, etc.

THE COPPER WORLD,

one (1) mile southwest in Person county, is down 112 feet, and has a small but valuable vein of bornite, etc., of high value in copper, and with a good tenor in silver.

THE HOLLOWAY,

near by, has two (2) veins, explored respectively 20 and 16 feet deep. The former shows a two and one-half ($2\frac{1}{2}$) feet vein of copper glance, etc., assaying 20 to 23 per cent. for copper, and with some silver; the latter is not deep enough to justify any statement.

At the

GILLIS MINE,

five (5) miles southwest of Blue Wing, little has been done. The vein is 18 inches to 5 feet wide, with a narrow but exceedingly rich streak of chalcocite, chrysocolla, etc.; this ore is readily dressed, and reaches a high contents in copper.

At the

BUCKEYE,

a perpendicular shaft has been sunk 30 feet, and a good showing made. The ore is bornite, etc.

THE YANCEY

has been idle for more than a year.

The ore is of like character, assaying as follows :

Copper 48.17 per cent., gold and silver \$9.94 ; copper 26.16 per cent., gold and silver \$8.01 ; copper 31.14 per cent., gold and silver \$2.62.

This has never been investigated and is little known.

COPPER.

None of the copper works of the State are now in operation.

THE ORE KNOB

establishment in Ashe county has been idle for three (3) years. The low and falling price of copper discouraged further work, though the ore body at the depth of 400 feet is still of fair average contents, and can by sorting, etc., be brought up to a good smelting mixture. The plant is large and extensive, and fitted for the production of ingot copper of high grade.

The copper works at Conrad Hill, and the incidental copper production at the Phoenix Mine Chlorination Works in Cabarrus county, have been described previously.

The localities now at work which can furnish copper ores are: the Person and Granville county mines, the Davidson or Emmons mine in Davidson county, Gold Hill in Rowan county, and the Phoenix mine in Cabarrus.

Several allusions to copper mines have been made in the course of this article, but no others are now at work.

SILVER, LEAD AND ZINC.

No mines yielding these metals are now at work, except that silver is an incidental associate of gold in every mine in the gold belts.

The chief localities from which these metals may be expected have already appeared in the notices of Silver Valley, Silver Hill, McMakin, Smart and Baker mines.

Gaston County.

ORMOND IRON ORE BANK.

This ore deposit is 30 miles south of west from Charlotte, and two and one-half ($2\frac{1}{2}$) miles from Wootton's Station on the Atlanta Railroad, and one-half ($\frac{1}{2}$) mile from that road, with which it is connected by a special branch.

This mine is one of several owned or controlled by the Carolina Mining Company, among which are the Yellow Ridge, Ellerson, Costner and others.

THE ORMOND

has been examined twice underground by the writer.

The deepest workings are 140 feet, and it has been exploited by levels for a length of 100 feet.

The ore body is reported to be from eight (8) to sixteen (16) feet wide, which is an underestimate, for in the level alluded to the width rose in one place to thirty (30) feet, and never fell below ten (10).

The vein carries ore of two (2) kinds; towards the hanging wall, and filling from one-third to one-half ($\frac{1}{3}$ to $\frac{1}{2}$) the crevice, is peroxide of iron pulverulent and

crumbly, so as to lose its consistency as soon as extracted; it has received the name of "Powder Ore;" it often has a nucleus of solid ore. The analyses of this class of ore were for four (4) shipments.

Silica.....	0.43 per cent.	.427 per cent
Alumina.....	.78 "	.257 "
Peroxide of iron.....	93.82 "	97.190 "
Lime.....	.45 "	.56 "
Magnesia.....	.18 "	.24 "
Phosphoric anhydride.....	.028 "	.076 "
Iron.....	65.57 "	68.03 "
Phosphorus.....	.013 "	.036 "

Toward the foot wall is a still larger body of compact ore, of deep reddish brown color, approximating to Tur-gite in composition; it is locally called "Block Ore." The analyses of three (3) shipments are shown below:

Silica.....	0.78
Alumina.....	1.41
Peroxide of iron.....	97.17
Lime .....	.488
Magnesia.....	.11
Phosphoric anhydride.....	.053
Iron	68.01
Phosphorus.....	.023

PRODUCTION OF NORTH CAROLINA IN PRECIOUS METALS.

The ascertained production for 1885 was.....	\$125,866.17
To this may be added for unreported product.....	15,000.00

NOTE.—The Phoenix mine chlor. works and a few of the smaller mines declined to report, and were extremely reticent. The amount produced there will aggregate \$15,000, and may reach \$25,000.

Gold and silver contents in ores shipped from the State and not included in the above	\$ 6,900.00
Total	\$147,766.17

NOTE.—The value of lead, lime and copper in the above ore shipments may have amounted to \$1,600.

RESUMÉ.

Number of men regularly employed.....	698
Number of men employed at intervals (estimated).....	100
Number of stamps.....	459
Chilian and other similar mills	17
Smelting establishments.....	1
Chlorination works.....	3
Designolle reduction works.....	1

Respectfully submitted,

GEORGE B. HANNA,
United States Assay Office, Charlotte, N. C.

MANUFACTURES.

Manufacturing Facilities.

Extracts from paper read before the General Assembly by W. C. Kerr, State Geologist, in January, 1881 :

“The circumstances which commonly determine the character and location of factories are a demand for their products, abundant and cheap raw materials, the necessary power (or the means for its generation), and available capital. It is unnecessary to add to this category skilled labor, because the fore-mentioned conditions usually suffice to attract or create the necessary skill ; and this is true also, in general, of the capital required, unless there be abnormal, hindering conditions.

“Now, it can be shown that all the necessary conditions exist in North Carolina for successful and profitable enterprise in many, and in some most important branches of manufacture.

“Consider, first, the most important of the above named manufacturing facilities, viz. : abundant and cheap power.

WATER POWER.

“The aggregate water power of the State is about 3,500,000 horse-powers, and this force is distributed

over the entire area of the State (with the exception of a few seaboard counties), and is thus brought into juxtaposition with whatever raw materials or other advantageous conditions may be found in any part of its territory. This is equal to the total power, water and steam, employed by all the manufacturing industries of Great Britain, the foremost manufacturing nation, and considerably exceeds that of the United States. Estimated in another way, it is equal to the power which would be produced by the combustion of nearly 4,000,000 tons of coal per annum.

“This power is due to an average annual rainfall of upwards of fifty inches, and an average elevation of 640 feet. Allowing 75 per cent. for evaporation, we have a residuum of about 46,000 tons to be discharged by the rivers. And a consideration of the greatest importance in estimating the availability of this power, is, that the rain-fall is nearly equally distributed through the months of the year, being as follows: For January, 4.5 inches; February, 5.3; March, 4.0; April, 3.9; May, 4.9; June, 4.3; July, 4.9; August, 6.1; September, 4.5; October, 3.3; November, 3.4; December, 3.7.

“If the whole of this force were employed in cotton manufacturing, it would be adequate to turn 140,000,000 spindles. All the cotton mills in the United States contain not quite 11,000,000. The water power of North Carolina would manufacture three times the entire crop of the country, whereas all the mills in operation on the continent only spin one quarter of it. Putting the crop

of this State at 400,000 bales, she has power enough to manufacture fifty times that quantity.

“The manufacture of cotton has been taken for illustration, because all the conditions of it are so well known, the raw materials are at hand in unlimited amount, and on terms which give a great advantage to the domestic manufacture, and the market is everywhere; and especially because the staple is produced in five-eighths of the territory of the State, and the water power of eight-ninths of it (all east of the Blue Ridge) is within seventy-five miles of the cotton fields: and these advantages are enhanced by a most favorable climate, a varied and elastic agriculture, capable of furnishing food supplies to any extent to meet the local demand, and by the presence of not only ample power for such other affiliated and ancillary industries as might be developed along with this, but also of abundant raw materials for these other industries, as will appear presently.

“And as to the wide distribution of this power, just now, as well as previously referred to as an enhancement of its value, a few data from different sections will suffice to illustrate it. Not to dwell on details, such as for example, the fall of the streams, as far east as Carteret county, below Newbern, to an extent of forty feet, and the like descent of the waters of Brunswick, Beaufort and other seaboard counties, we will confine ourselves to certain aggregates, distributed through the territory of the State above and west of the limit where the streams emerge from the hill country into the great coast cham-

paign, at an elevation of about one hundred feet above the sea. Beginning with the Roanoke river, the discharge of which at Haskins' Ferry, some fifty miles above Weldon, is 170,000 cubic feet per minute, we have a force of 335 horse powers for each foot of fall, or an aggregate, for the part of the river lying in this State, of 70,000 horse powers.

"Tar river has not been measured, but its force above the Wilmington and Weldon railroad is not less than eight to ten thousand horse powers. The Neuse near Raleigh gives a force of twenty-two horse powers per foot, which will make for the whole river and its tributaries above Goldsboro, about the same aggregate as the Tar. The power employed in all the mills at Lowell, Mass., and at Lawrence is nine thousand, and the population of these towns is fifty and forty thousand respectively; this is an indication of the possible value of these rivers to the future development of the State, and these streams, draining only the lower section of the hill country, are less favorably situated for manufacturing purposes, and so have received almost no attention.

"Haw river, the next in order as we go west, is the only stream in this quarter of the State which has received anything like adequate appreciation; it turns more spindles than any other river in the State. The force of this stream is not less than forty thousand horse powers; and that of Deep river, above its confluence with the Haw, is nearly as much, and the total of these and of the Cape Fear, with its other principal affluents, will not

be less than one hundred and thirty to one hundred and forty thousand horse powers, as previously stated. Smiley's Falls alone gives a force of 15,000.

"Leaving out smaller intermediate rivers, the Yadkin, measured near Salisbury, at the railroad bridge, discharges 155,000 cubic feet per minute, which gives two hundred and ninety-four horse powers per foot, or, for the whole stream to the southern border of the State, with its fall of 1,000 feet from Patterson, two hundred and fifty-five thousand horse powers, a force capable of turning all the 10,000,000 spindles in the United States. Its tributaries would add at least 20 per cent. to this estimate, giving a grand total of more than 300,000. The Catawba, above the State line, with its chief tributaries, will give more than two hundred and fifty thousand horse powers, the fall at Mountain Island alone reaching not less than 12,000.

"Broad river, with its tributaries out of Cleveland, Rutherford and Polk counties, and a fall for most of them of five hundred feet and upwards, will give an aggregate of sixty to seventy-five thousand horse powers.

"Passing beyond the Blue Ridge, the French Broad at Asheville measures one hundred and twenty-five, and at Warm Springs one hundred and seventy horse powers, which gives for this part of the river, from Asheville to the State line, 100,000. At Brevard, in Transylvania, it measures forty-eight, which adds 10,000, and the tributaries like the Swannanoa, Ivey, Laurel, &c., add 5,000 each, so that the French Broad may be set down at 175,000 horse powers.

“The Nolechucky, in Mitchell county, measures near the State line, 190 horse-powers; so that we shall have for this hydrographic basin, between the Black, the Roan and the Grandfather, not less than 150,000 horse-powers. New river and its affluents in Watauga, Ashe, and Alleghany, will give about 120,000. The Tennessee, at Franklin, gave 40 horse-powers per foot; and this with the Tuckasegee, Oconaluftee and Nantehaleh, which will average 25,000 each, and the Tennessee, with a fall of an additional 500 feet below the confluence of its main tributaries, will make a total for this basin of not less than 150,000 horse-powers. Pigeon river was not measured, but it differs little in power from the Tennessee above its confluence with the Tuckasegee, and will give, with its much greater fall to the State line, a probable aggregate of sixty to seventy-five thousand. And for the Hiwassee, the same estimate will hold.

“If these approximate *low water* estimates of only a score of the larger rivers, be summed, they amount to one and one half million horse-powers, leaving out of the count a thousand smaller streams of 500 to 1,000 horse-powers each.

“The distribution of the water power may be illustrated in another way, by estimating its amount for a given territory in different parts of the State. Take, for example, Chatham county in the east and Wilkes in the west: the amount of force available in the former may be approximated by taking that of its principal

streams, thus: Haw river will give 25,000 horse-powers; Deep river, below Carbonton, 10,000; Cape Fear, 6,000; Rocky river, 3,000; New Hope, 1,000; total 45,000. For Wilkes the sum of the forces of all its dozen considerable rivers and as many more large creeks, added to that of the Yadkin, will give a total of not less than 70,000 horse-powers."

STEAM POWER.

The abundance of wood furnished by our forests and wooded portions of almost every farm will make it, on account of its cheapness, the fuel for steam power and for ordinary heating purposes for many years to come. Saw mills get their motive power from waste lumber. Cotton gins, grist mills, and what may be generally termed plantation mills, are all run by steam produced from wood cut near them. In the interior, where there is no railway or water transportation, all the small factories, such as wagon factories, foundries, plow factories, &c., have their machinery moved by steam made from wood. Wood can be bought at prices ranging from seventy-five cents to three dollars per cord, delivered, and until the supply is perceptibly diminished, or freight rates on coal are reduced very considerably, it will be relied on to create the power needed.

The estimate of wood used for domestic purposes made by the census office is 7,434,690 cords, valued at \$9,019,569.

The completion of the Western North Carolina Railroad across the Blue Ridge to the Tennessee line at Paint Rock, has opened the East Tennessee coal fields to people living along the line of this road and its connections. Good bituminous coal is delivered at stations along these lines at about five dollars and fifty cents per ton.

The coal from the Chatham mines, on Deep river, when worked, is sold at a price even less than this, but the supply is not regular.

In no part of the State, where there is an eligible location for purposes of manufacturing, and where the raw material is cheap, abundant and accessible, is there any want of the means necessary for generating the needed power, whether this power is natural or created.

Cotton Factories.

Cotton manufacturing has long been an established industry in North Carolina. Though generally prosperous, it advanced cautiously until within the last six or eight years, within which time it has been doubled.

In 1870 the census reported thirty-three establishments, with a capital of \$1,030,900, operating 618 looms and 39,897 spindles.

In 1880 the census states the number of establishments to be forty-nine, an increase of sixteen over that

of 1870, with a capital of \$2,855,800, an increase of \$1,824,900; 1,790 looms, an increase of 1,172; and 92,385 spindles, an increase of 52,488.

The actual number of completed mills in the State, ascertained by reports from mill owners made to the Department of Agriculture, a list of which is subjoined, is eighty. These mills operate 4,519 looms and 200,333 spindles. It will be seen that, within the past sixteen years, the number of establishments has more than doubled. The number of looms has increased six hundred and fifty-five per cent., and the number of spindles four hundred per cent. Since the census report of 1880 the number of looms and spindles has more than doubled.

There are no accessible statistics by which a comparison of products can be made, but the large increase in looms will add greatly to the money value of the total product. Number 14 is the average yarn spun. The cloths, bags and bagging woven are of excellent quality and rank as leading standard goods in the markets. All these mills, except about twelve, are operated by water power. While good water powers will always be favorite investments, the low rates at which coal is and will continue to be delivered at stations along the lines of railway that run through the cotton belt, and where raw material for manufacture can be bought at factory doors, will modify the almost exclusive use of water as a motive power, and will aid in building mills in localities that are supplied with the other governing facilities for manufacturing.

The amount of capital invested in cotton factories in the State by other than native citizens is inconsiderable.

The opinion of the best-informed and most experienced manufacturers is to the effect that the proven, undeniable advantages of making at least the coarser fabrics where the material for them is grown, and where a favorable climate, light taxes and cheap labor are auxiliary conditions, will maintain the rate of increase of the past five years.

COTTON MILLS IN NORTH CAROLINA.

COUNTY.	FACTORY.	POST-OFFICE.	LOOMS	SPINDLES.	PROPRIETORS.
Alamance	Clover Orchard Factory	Clover Orchard.....	40	1,200	W. C. Holman.
Alamance	Rock Creek Manufacturing Co.....	Graham	30	.....	C. C. Curtis & Co.
Alamance	Saxapahaw	Graham .....	.....	4,740	Holt, White & Williamson.
Alamance	Carolina Cotton Mills.....	Graham	60	3,000	J. H. & W. E. Holt & Co.
Alamance	Alamance Cotton Mills.....	Graham	95	1,000	E. M. Holt's Sons.
Alamance	Belmont Cotton Mills.....	Graham	112	2,600	L. B. & L. S. Holt.
Alamance	Glencoe Cotton Mills.....	Company Shops.....	186	3,120	W. E. & J. H. Holt.
Alamance	Granite	Haw River.....	220	8,424	T. M. Holt.
Alamance	Altamahaw.....	Company Shops.....	30	1,008	Davidson & Gaut.
Alamance	Falls of Neuse Manufacturing Co..	Swepsonville	121	2,240	R. Y. McAden.
Alamance	Ossipee	Gibsonville	160	2,000	J. N. Williamson.
Alamance	E. M. Holt Plaid Mills.....	Company Shops.....	100	.....	Win. A. Ervine, Sec. and Treas.
Alamance	Aurora Cotton Mills	Company Shops.....	126	1,904	L. S. Holt.
Alexander.....	Sulphur Springs Manufacturing Co.	Stony Point.....	.....	600	J. L. Davis & Co.
Bertie.....	Harden Manufacturing Co.....	Taylorsville	12	528	Alsbaugh Bros.
Cabarrus.....	Odell Manufacturing Co.....	Concord .....	.....	612	C. T. Harden, President.
Cabarrus.....	Patterson Mills.....	Concord .....	.....	400	W. J. Black.
Caldwell.....	Granite	Patterson.....	246	6,000	J. M. Odell, President.
Caldwell.....	Cleveland Mills.....	Shelby.....	20	2,000	Gwyn, Harper & Co.
Cleveland.....	Morgan Falls Manufacturing Co..	Double Shoals.....	.....	2,500	Shuford, Gwyn & Co.
Catawba.....	Beaumont Falls Manufacturing Co.	Monbo.....	.....	848	Schenck, Ramsour & Co.
Catawba.....	Newton Cotton Mills.....	Newton.....	42	1,224	E. A. Morgan, Agent.
Catawba.....	Long Island Manufacturing Co.....	Catawba Station.....	40	1,056	Turner Bros.
Craven.....	New Berne Manufacturing Co.....	New Berne.....	55	2,000	W. H. Williams, President.
Cumberland.....	Manchester Mills.....	Manchester .....	.....	1,000	Powell & Shuford.
Cumberland.....	Linwood Cotton Mills.....	Fayetteville.....	71	1,734	R. S. Huske.
Cumberland.....	Beaver Creek.....	Fayetteville.....	62	500	J. M. Beasley.
Cumberland.....	Bluff Creek Cotton Mills.....	Fayetteville.....	.....	3,232	E. J. Lilly, President.
Cumberland.....	Rock Fish Manufacturing Co.....	Fayetteville.....	.....	3,056	E. J. Lilly, President.
				4,500	T. C. Oakman, President.

COTTON MILLS IN NORTH CAROLINA—CONTINUED.

COUNTY.	FACTORY.	POST-OFFICE.	LOOMS	SPINDLES.	PROPRIETORS.
Cumberland	Hope Mills.	Fayetteville.....	24	4,728	W. C. Houston,
Durham	Orange Factory.....	Orange Factory.....	45	1,300	S. W. Holeman.
Forsyth	Fries' Factory.....	Salom.....	102	3,342	F. & H. Fries.
Franklin	Laurel Cotton Factory.	Laurel.....	.....	650	J. F. Jones.
Gaston	Stovesville Cotton Mill	Garibaldi.....	.....	1,400	Thos. H. Gaither.
Gaston	Tuckasege Mills.....	Mt. Holly.....	50	2,500	Tuckasege Manufacturing Co.
Gaston	Normandy Mill, No. 1.	Lowell.....	.....	2,500	John R. Hall.
Gaston	Normandy Mill, No. 2.	Lowell.....	.....	2,000	A. P. Rhyme & Costner.
Gaston	Hooper Manufacturing Co.	Mountain Island.....	150	6,000	W. J. Hooper.
Gaston	Wilson's Cotton Mills.	Lowell.....	350	3,000	Jos. H. Wilson.
Gaston	McAden's Mill.	McAdensville.....	30	864	W. M. Kline, Secretary.
Guilford	Mount Pleasant Manufacturing Co.	Brick Church.....	.....	4,000	C. P. Meudenhall.
Guilford	Oakdale Manufacturing Co.	Jamestown.....	.....	528	T. A. Nicholson & Son.
Fredell	Nicholson's Mills.	Nicholson's Mills.....	.....	600	Morrison, Gaither & Co.
Fredell	Lowell Cotton Factory.	Eagle Mills.....	.....	1,320	Wm. Edgerton.
Johnston	Dry Shoals.	Pine Level.....	20	3,000	Phifer & Allison.
Lincoln	Charlotte Cotton Mills.	Lincolnton.....	.....	8,296	Oates Bros.
Mecklenburg	Yadkin Falls.	Charlotte.....	12	600	McAlister & Co.
Montgomery	Swift Island.	Milledgeville.....	.....	1,000	.....
Montgomery	Rocky Mount Mills.	Rocky Mount.....	80	3,616	B. H. Bunn.
Nash	Tuscarora.	Wilmington.....	156	1,500	.....
Nash	New Hanover.	Elizabeth City.....	1	892	S. S. Fowler.
Pasquotank	Clement Attachment.	Central Falls.....	36	5,000	J. H. Ferree, President.
Randolph	Central Manufacturing Co.	Cedar Falls.....	60	2,400	O. R. Cox, Treasurer.
Randolph	Cedar Falls.	Columbia Factory.....	.....	2,880	W. H. Watkins, Agent.
Randolph	Columbia Manufacturing Co.	Franklinsville.....	20	960	Benj. Moffitt, Treasurer.
Randolph	Franklinsville Manufacturing Co.	Franklinsville.....	500	1,800	Hugh Parks, Treasurer.
Randolph	Randolph Manufacturing Co.	Randleman.....	118	4,008	J. H. Ferree, President.
Randolph	Naomi Manufacturing Co.	Randleman.....	290	3,500	J. H. Ferree, President.
Randolph	Randleman Manufacturing Co.	Foust's Mills.....	26	1,100	.....

COTTON MILLS IN NORTH CAROLINA—CONTINUED.

COUNTY.	FACTORY.	POST-OFFICE.	LOOMS	SPINDLES.	PROPRIETORS.
Randolph.....	J. M. Worth Manufacturing Co.....	Worthville.....	80	5,000	J. M. Worth.
Randolph.....	Enterprise.....	.....	.....	900	Enterprise Manufacturing Co.
Richmond.....	Richmond Cotton Mills.....	Laurel Hill.....	.....	2,408	Mark Morgan.
Richmond.....	Great Falls Manufacturing Co.....	Rockingham.....	134	4,288	R. L. Steele, President.
Richmond.....	Pee Pee.....	Rockingham.....	153	4,032	W. L. Steele, President.
Richmond.....	Robedel.....	Rockingham.....	100	3,264	R. L. Steele, President.
Richmond.....	Ledbetter.....	Rockingham.....	.....	1,000	T. B. & J. S. Ledbetter.
Richmond.....	Midway.....	Rockingham.....	.....	2,040	T. C. Leak & Co.
Richmond.....	Malloy's.....	Rockingham.....	.....	1,200	.....
Rockingham....	Leaksville Cotton Mills.....	Leaksville.....	54	4,342	J. T. Morehead.
Surry.....	Hamburg Mill.....	Mt. Airy.....	.....	576	A. Hines.
Surry.....	Elkin Manufacturing Co.....	Elkin.....	15	1,500	R. R. Gwyn, Agent.
Surry.....	Mt. Airy Mill.....	Mt. Airy.....	25	1,000	J. F. & W. A. Moore.
Surry.....	Green Hill Manufacturing Co.....	Mt. Airy.....	60	2,000	Green Hill Manufacturing Co.
Wilson.....	Wilson Cotton Mills.....	Wilson.....	.....	5,400	Wilson Cotton Mill Co.
Total.....			4,519	200,333	

Woollen Mills.

There were according to the census of 1870 fifty-two establishments for the manufacture of wool, operating ninety-seven looms and 2,806 spindles. This enumeration embraced not only mills of considerable size, but also the small carding establishments. Since then the number of these has probably diminished, as the census of 1880 reported only forty-nine as the total number of such establishments. There has been, however, a substantial improvement in the mills themselves, both in their capacity for doing more work and better work, and also in number. The subjoined list of woollen mills will show thirteen mills now running, with 131 looms and 4,466 spindles. The supply of domestic wool is ample and convenient, and there is a ready sale at home and abroad for all the products of the factories. Blankets of excellent quality and fine cassimeres are made by the Forsyth, Catawba, Rockingham and Surry county mills. All the mills are run by water power except the Fries, Lash and Shortridge mills, in which steam is used. Until sheep raising becomes more of a specialty, and ceases to be a mere branch of general agriculture, there is no reason for believing that the increase of woollen manufactures will more than keep pace with that of population.

WOOLLEN MILLS IN NORTH CAROLINA.

COUNTY.	FACTORY.	POST OFFICE.	LOOMS.	SPINDLES.	PROPRIETORS.
Buncombe.....	Reems Creek Woollen Mills.....	Weaversville.....	5	210	John Cairns.
Caldwell.....	Gwyn, Harper & Co.'s.....	Patterson.....	17	500	Gwyn, Harper & Co.
Catawba.....	Pleasant Valley Mills.....	Jacob's Fork.....	.....	168	Mosteller and Warlick.
Forsyth.....	Lash's Mills.....	Bethania.....	14	500	T. B. Lash.
Forsyth.....	Fries' Mills.....	Salem.....	40	678	F. & H. Fries.
Gaillard.....	Freeman's Mills.....	Freeman's Mills.....	6	240	Bodee & Freeman.
Lincoln.....	.....	North Brook.....	2	180	O. B. Jenkins & Sons.
Richmond.....	Shortridge's Mills.....	Hamlet.....	6	200	John Shortridge.
Rockingham.....	Leaksville Woollen Mills.....	Leaksville.....	6	240	J. T. Morehead, A. P. Ford.
Rowan.....	Salisbury Woollen Mills.....	Salisbury.....	7	200	Salisbury Woollen Mill Co.
Surry.....	Elkin Valley Mills.....	Elkin.....	16	720	Gwyn & Chatham.
Surry.....	Moore's Mill.....	Mount Airy.....	10	450	J. F. & W. A. Moore.
Surry.....	Allred's Mill.....	Mount Airy.....	2	120	Albert Allred.
			131	4,466	

Tobacco Factories.

The enterprise of the people of North Carolina since the civil war has been trammelled by a want of capital. This has debarred them from entering upon undertakings of great magnitude, or, if attempted, they have been prosecuted at great disadvantage. Our cotton factories, in their increase, show what may be done by energy, skill and industry, under the most straitened circumstances. Without external aid all have gone on increasing, and many have become imposing establishments. The manufacture of tobacco was attended to a less extent with this disadvantage. This business did not require the same amount as cotton manufacturing. It could, indeed, be entered upon and prosecuted with a very moderate capital. In this field of manufacture the enterprise of the people of the State has been most strikingly exhibited. The increase in tobacco factories during the decade included between the census of 1870 and 1880 is not far from double. The number in 1870 was 110; the number now is 218. The increase in the value of the property embarked in the pursuit is still greater. A recent sale of an interest in one of these factories will show this increase—an extreme case it may be, but nevertheless, an actual one. An interest in a factory in Durham recently sold for a sum but a fraction less than the whole capital invested in the business in 1870. These factories are widely distributed through the State;

and property of every kind has been enhanced in value, the sum of comfort has been increased through the employment of women and children, and the general prosperity promoted wherever they have been established. The following table will show their number and location :

TOBACCO FACTORIES IN NORTH CAROLINA.

COUNTIES.			COUNTIES.		
	Tobacco Factories.	Cigar Factories.		Tobacco Factories.	Cigar Factories.
Alamance	6	1	Mecklenburg	3	3
Buncombe	4	.....	McDowell	1	.....
Caldwell	1	.....	New Hanover.....	.....	2
Caswell	3	1	Orange.....	2	.....
Catawba.....	5	2	Person	1	2
Cleveland.....	5	2	Rockingham	23	1
Craven.....	.....	1	Rutherford.....	1	.....
Davie.....	7	.....	Rowan.....	6	1
Davidson	3	1	Stokes	8	.....
Durham	10	4	Surry	22	.....
Forsyth.....	41	2	Vance	4	.....
Granville	5	.....	Wake	2	1
Guilford	9	2	Wilkes	4	.....
Hertford.....	1	.....	Wilson .....	.....	1
Iredell.....	7	1	Yadkin.....	9	.....

107 17
 83 14
 —————
 190 28

81 11

Manufactures of Wood.

By the census enumeration of 1880, there were 776 establishments, with a capital of \$1,734,217, employing 2,938 men, receiving \$447,431 wages. The products in part were 241,822,000 feet of lumber, 13,340,000 laths,

8,707,000 shingles, 1,253,000 spool and bobbin stock. The value of logs \$1,490,616, mill supplies \$86,523, and the total value of all products was \$2,672,796. Most of these establishments are saw mills. Almost in every village there are carpenter shops, furniture and wagon factories, with capacities suited to the wants of the communities supplied.

Raleigh, Wilmington, Newbern, Salisbury, Company Shops and Laurinburg have car shops, where railway cars for passengers and freight are made on the most approved models, and of most substantial and beautiful material drawn from the woods of the State. In all the cities and larger towns are builders and contractors who own and operate extensive factories. The hard woods have laid the foundation for extensive manufactures. There are spoke and handle factories at several points in the middle section of the State, where these woods are the predominant and almost unimpaired growth, which ship their products to all parts of this country and Europe. At Hickory and at Salem there are extensive wagon factories that ship their work to all parts of the Union. Wilson, Goldsboro, Carthage, Fayetteville and Raleigh, have important buggy and carriage factories; and at Winston, Raleigh, Statesville, Lexington, Durham, Bush Hill and High Point, there are factories for the manufacture of shuttles and bobbins of dogwood and persimmon.

There is at Newbern a factory for manufacturing plates and dishes of gum wood. It is the only factory of this kind. Its capacity is 80,000 plates per day.

Four hundred and fifty sweet gum logs forty-eight inches long are used per week, and four large flats are kept running to float in the logs. Engines with 200 horse power drive the machinery, and the factory is run on full time to keep up with its contracts. The capital invested is \$20,000, and the amount paid in wages is about \$21,000.

The most valuable cabinet woods, such as walnut, cherry, maple and birch, have been felled in large quantities far in the interior and shipped abroad. Buyers from the North and West have made large purchases of these trees during the past year in the mountain counties. Since the display of unknown and almost incredible wealth of the State in its various woods, at the Atlanta Exposition, there has been a very active and growing demand for them. The supply is ample for shipment beyond the borders of the State for years to come, and it offers certain profits to enterprising and skillful workmen who will build their workshops near it.

Iron Manufactures.

The census of 1880 puts down twenty manufactories of iron and steel in North Carolina, with a capital of \$759,400. As long as it took five or six tons of coal to convert two tons of ore into iron, the

transportation of fuel was so heavy and expensive that it put manufacturers in the State at a disadvantage, and made it profitable to miners to ship their ores where they had facilities to the great iron-making centres. But now, when under the present improved system of manufacture, one ton of coal makes a ton of iron, the advantages are reversed, and the fuel will be brought to the ore beds. The introduction of cheap coal, and the completion of the Western North Carolina railroad and the East Tennessee & Western N. C. road to the Cranberry mines, will build up furnaces and manufactures, and make them among our most important industries.

There are large machine shops, railroad shops, foundries, agricultural implement works, in all the cities and large towns, and in every village and at most of the country stores blacksmiths ply their trade.

Paper Factories.

There are five paper mills in the State—Buffalo, in Cleveland county; Lincolnton and Longshoals, in Lincoln county; Salem, in Forsyth county; and Falls of Neuse, in Wake county.

The daily capacity of the first three is about three tons each, and the products are French folios, bristol boards, writing paper, blotting, book and newspaper, manilla, wrapping and colored cover papers.

The capacity of the Falls of Neuse mills is one ton heavy paper per twelve hours, and 1,500 pounds light paper. Its products are book, Nos. 1 and 2; news, Nos. 1 and 2; manilla and wrapping, No. 1. The water power is excellent.

The capacity of the Salem mill is two tons per day.

The supply of poplar and soft old-field pine has already attracted the attention of manufacturers of paper pulp, and, as the material has been tested and found satisfactory, and is to be had at almost nominal cost, there is little doubt that its manufacture will be one of the new industries. A company for this purpose has been organized at Newbern, and the product made from cypress stock for fineness and length of fibre has no equal.

Flouring and Grist Mills.

Mills of these sorts are, as a rule, of limited capacity, and are run to grind the wheat and corn grown in the neighborhood and brought to their doors. But little of the grain converted into meal or flour is sent away to market, and when they have supplied the communities for whose apparent convenience they were built, the mill wheels stop. A few large mills—some run by steam and others by water power—make excellent meal and flour for the large provision markets, and their brands have wide reputation.

At the last Mechanics' Institute Fair, held in Boston, wheat, corn, flour and meal grown and ground in North Carolina attracted especial attention, and were pronounced the best on exhibition. The wheat was plump and full, and weighed from four to five pounds above the commercial standard, and the flour produced from it was white and smooth and rich.

The corn of the State is hard flint corn, heavier than the western corn, and better. It makes a white, sweet meal, and is largely bought by millers to mix with Western corn in grinding, to give the meal color and body. Formerly these mills were run almost entirely by water power, and there is still a strong feeling among dealers and consumers in favor of water-ground meal. This, however, will not continue long. Improved machinery, driven by steam, produces a meal that defies detection; and cheap portable engines, and mills that can be placed wherever it is wished, will make convenience overcome prejudice.

Rice Mills.

The increased and growing production of both golden seed or lowland and white or upland rice has furnished in abundance raw material for rice mills, and they have increased in number and capacity during the past year. There are now in operation four mills.

The Carolina Rice Mill, daily capacity, 1,000 bushels, Wilmington.						
Newbern	"	"	"	"	500	" Newbern.
Washington	"	"	"	"	500	" Newbern.
Goldsboro	"	"	"	"	468	" Goldsboro.

The products of these mills are clean rice and what are termed by-products, rice flour and rice polish. Rice flour is the skin covering the grain, between it and the chaff. It is a slightly brownish meal, about the appearance of "wheat middlings," and is a rich, strong food for horses, cattle and hogs, producing fat rapidly. It contains about thirteen and a half per cent. of fat. Rice polish shows about half this amount of fat. This is made by subjecting rice cleaned of hulls and skins to very rapid friction. The fine particles turned off are the polish. It is a whiter and finer meal than the flour.

Fertilizer Factories.

There are six fertilizer factories in the State. In 1883 there was but one. Two are situated near Wilmington, one in Goldsboro, one in Raleigh, one in Durham, and one in Tarboro.

The Navassa Guano Company's works, near Wilmington, on the West bank of the Cape Fear river, in Brunswick county, are very extensive, and their mills, offices and storage houses, make up a village in themselves.

The tracks of the Wilmington and Weldon, Wilmington, Columbia and Augusta, and Carolina Central railroads pass their grounds, and with their wharf conveniences supply necessary transportation. The company was organized in 1869, with a paid up capital of \$200,000. The works have been improved, and their capacity increased from time to time, until their annual capacity has reached 15,000 tons. There are large double chambers for making sulphuric acid, and a single for muriatic acid. The basis of their products is the Navassa and South Carolina phosphate rocks. From the beginning the enterprise has been highly successful.

The Acme Manufacturing Company, at Cronly, 17 miles from Wilmington, has built a neat manufacturing village for the operatives employed in its works. The mill's acid chambers and warehouses are models for the purposes of their construction. The capacity of the factory, with the machinery now run, is fifty tons of ammoniated fertilizer per day. The output can be considerably increased in the present buildings by the addition of a few more machines.

The Raleigh Oil and Fertilizer Factory was built in 1884. It is well arranged and commodious, and has a capacity of sixty tons per day, which can be increased to one hundred tons.

The factory at Tarboro will have a capacity of —.

The Durham Fertilizer Company has a capacity of thirty-five tons ammoniated fertilizer per day. Its facilities are ample.

French Brothers have a mill at Rocky Point, and the North Carolina Phosphate Company has one at Castle Haynes and one at Raleigh, for grinding the conglomerate rock, found on the lower Cape Fear, in which phosphatic nodules, sharks' teeth, shells, &c., are bound together by a cement of carbonate of lime.

Pine Leaf Manufactory.

The manufacture of the pine leaf into a material to be used in the arts is, so far as known, pursued only in this State. The works are built at Cronly, a station on the Carolina Central railroad, seventeen miles from Wilmington.

The daily product is fifteen hundred pounds of pine leaf hair and curled pine straw, sold to furniture and carriage manufacturers for stuffing cushions, chairs, sofas, &c., while the latter is used exclusively for mattresses, and is so prepared as to preserve the balsamic odor, for which medicinal virtues are claimed.

In the process of manufacture an oil is distilled, called Pinoleum, that is considered valuable for its curative properties.

The mattresses are sold largely for hospital purposes, and a large trade for all the products of the factory has been established in the Northern States and Canada.

Carders, looms and spinners have been added, and the fibre is converted into carpets and mattings which will be both useful and healthful.

The natural color is brown, like the dried straw, but the fibre takes and holds dyes as well as any fibre, and better than most, and can be bleached nearly white.

Mill Stones.

There are in Moore county, near the Raleigh and Augusta Air-Line railroad, two mill and mill stone factories in operation. The material used has been pronounced by competent authority as unsurpassed for stones for grinding corn, and is abundant. It has been used in flouring mills, and occasionally found to be nearly equal to the French buhr-stone.

The North Carolina Mill Stone Company, at Parke-wood, employs forty men and turns out fifteen portable mills and ten mill stones per month. The value of the annual product is \$60,000. Mills have been shipped into more than half the States and into Canada.

The Little River Millstone Quarry is situated on Little river, six miles from Manly, on the Raleigh and Augusta Air-Line railroad. Five experienced workmen are employed, and a mill is turned out every three weeks. Mills complete or mill stones are manufactured of 30, 33 and 36 inches, and have been widely sold in the State.

Cotton Seed Oil Mills.

There are nine cotton seed oil mills in the State :

The Fayetteville Oil Mill, capacity.....	20	tons	per	day.
Acme, Wilmington	10	"	"	"
Charlotte.	20	"	"	"
Tarboro	20	"	"	"
Raleigh.....	60	"	"	"
Washington, J. E. Meyers.....	...	"	"	"
Goldsboro Oil Company, capacity.....	20	"	"	"
Newbern Oil Mills, capacity.....	30	"	"	"
Elizabeth City Oil Mills.	12	"	"	"

The cultivation of cotton has grown to such an extent as to make the seed sufficient in quantity to attract the attention of cotton seed oil manufacturers. If the statistics are correct 180,000 tons of seed were used by the mills in the United States in 1881. The cotton crop of the State is estimated at 400,000 bales, and allowing 800 pounds seed per bale, the cotton seed of this State would furnish nearly all the mills in operation in the United States. The regular growth of the industry would seem to indicate that it is profitable. Of the mills in this State, one was built in 1880, three in 1882, and five within the last three years. It is generally agreed that if the raw material, the seed, can be bought at reasonable prices, there is no more certain manufacturing enterprise. The supply of seed is large enough, but whether the farmers will sell them at prices which the manufacturer

can afford to pay for them is the problem that is to be worked out. The mills are owned by prudent and successful men, and unless the difficulties referred to are insurmountable they will become an established branch of our manufactures.

AGRICULTURE.

The Farms in North Carolina.

ACRES OF LAND IN FARMS IN NORTH CAROLINA,
ACCORDING TO THE CENSUS OF 1880.

COUNTY.	IMPROVED.	UNIMPROVED.
The State.	6,481,191	15,882,367
Alamance	77,799	129,269
Alexander	48,985	97,680
Alleghany	74,747	75,278
Anson	90,061	192,787
Ashe	117,174	169,988
Beaufort	44,887	228,538
Bertie	85,504	202,533
Bladen	40,563	310,501
Brunswick	19,399	307,680
Buncombe	99,602	241,940
Burke	44,496	140,623
Cabarrus	90,514	110,129
Caldwell	47,405	160,174
Camden	36,757	66,901
Carteret	22,472	69,660
Caswell	89,885	147,249
Catawba	78,080	141,593

COUNTY.	IMPROVED.	UNIMPROVED.
Chatham.....	126,940	302,306
Cherokee.....	30,668	152,041
Chowan.....	36,052	49,180
Clay.....	17,691	71,954
Cleveland.....	87,691	176,248
Columbus.....	39,031	363,443
Craven.....	52,392	199,199
Cumberland.....	59,639	314,948
Currituck.....	41,170	56,846
Dare.....	2,553	23,436
Davidson.....	129,664	209,331
Davie.....	66,810	85,607
Duplin.....	73,061	307,473
Edgecombe.....	136,015	135,422
Forsyth.....	79,350	135,773
Franklin.....	90,118	175,132
Gaston.....	70,672	130,673
Gates.....	49,984	107,702
Graham.....	8,551	53,892
Granville.....	150,127	240,186
Greene.....	75,942	86,828
Guilford.....	148,392	208,261
Halifax.....	137,245	217,754
Harnett.....	42,927	186,107
Haywood.....	52,132	118,170
Henderson.....	45,445	114,818
Hertford.....	55,857	130,261
Hyde.....	33,153	42,772
Iredell.....	112,365	211,716
Jackson.....	32,853	140,413
Johnston.....	107,585	315,235
Jones.....	53,605	139,324

COUNTY.	IMPROVED.	UNIMPROVED.
Lenoir.....	85,809	128,034
Lincoln	57,523	112,832
McDowell	38,795	126,993
Macon... ..	39,370	178,679
Madison.....	69,087	164,488
Martin.....	57,030	184,883
Mecklenburg.....	146,243	147,164
Mitchell.....	42,572	108,687
Montgomery	48,117	192,952
Moore.....	70,922	294,240
Nash	85,685	214,716
New Hanover.....	7,715	43,057
Northampton.....	99,885	172,763
Onslow	56,768	215,932
Orange	86,401	190,192
Pamlico	17,525	90,397
Pasquotank.....	51,770	46,464
Pender.....	38,699	290,654
Perquimans	54,433	63,994
Person	76,797	141,884
Pitt.....	107,255	227,150
Polk.....	21,762	77,052
Randolph	100,888	292,996
Richmond.....	76,067	235,990
Robeson.....	120,480	403,842
Rockingham	84,188	211,458
Rowan.....	110,178	174,553
Rutherford.....	66,698	205,612
Sampson	121,469	396,479
Stanly	61,279	155,775
Stokes	57,393	168,780
Surry	81,690	201,616

COUNTY.	IMPROVED.	UNIMPROVED.
Swain.....	14,275	108,466
Transylvania.....	20,636	80,219
Tyrrell.....	19,801	60,293
Union.....	86,428	216,832
Wake.....	161,272	316,814
Warren.....	87,183	168,553
Washington.....	31,695	77,360
Watauga.....	69,999	139,993
Wayne.....	123,629	195,664
Wilkes.....	100,151	292,205
Wilson.....	66,027	118,885
Yadkin.....	60,070	138,011
Yancey.....	45,689	113,790

GROSS NUMBER OF FARMS.

The total number of farms in North Carolina is, according to the census of 1880, 157,609.

CLASSIFICATION ACCORDING TO ACREAGE.

The number of farms under 3 acres is	277
“ “ “ “ 3 and under 10 acres.....	13,314
“ “ “ “ 10 and under 20 “	34,148
“ “ “ “ 50 and under 100 “	34,007
“ “ “ “ 100 and under 500 “	61,806
“ “ “ “ 500 and under 1,000 “	5,063
“ “ “ “ 1,000 and over	1,721

CLASSIFICATION ACCORDING TO TENURE.

The number of farms occupied by owners is.....	104,887
The number of farms rented for fixed money rental is.....	8,644
The number rented for shares of produce is.....	44,078

CLASSIFICATION OF FARMS OCCUPIED BY OWNERS.

The number of farms so occupied under 3 acres is.....	128
" " " " " " 3 and under 10 acres	2,141
" " " " " " 10 and under 20 acres.....	3,851
" " " " " " 20 and under 50 acres.....	13,973
" " " " " " 50 and under 100 acres.....	25,929
" " " " " " 100 and under 500 acres.....	52,810
" " " " " " 500 and under 1,000 acres.....	4,447
" " " " " " 1,000 and over.....	1,608

FARMS PAYING A FIXED MONEY RENT.

Under 3 acres..	23
3 acres and under 10.....	921
10 acres and under 20.....	1,553
20 acres and under 50.....	3,023
50 acres and under 100.....	1,305
100 acres and under 500.....	1,639
500 acres and under 1,000.....	145
1,000 acres and over.....	35

FARMS PAYING RENT IN SHARES.

Under 3 acres.....	126
3 acres and under 10....	4,211
10 acres and under 20.....	7,910
20 acres and under 50.....	17,152
50 acres and under 100.....	6,773
100 acres and under 500.....	7,357
500 acres and under 1,000	471
Over 1,000 acres	78

Agricultural Population.

The census of 1880 shows that three-fourths of the population of the State were engaged in agriculture; one seventh in professional and personal service; one fifteenth in manufacturing, mining and mechanical operations; and one thirtieth in trade and transportation.

Agricultural and Horticultural Societies.

There are several agricultural societies in the State, and their transactions and annual meetings are productive of much good in bringing together the farmers and in competitive exhibitions of the products of their skill and labor. Prominent among these are:

The State Agricultural Society, annual fair held at Raleigh.

District Grange, fair held at Woodlawn.

Western North Carolina Agricultural Society, annual fair held at Asheville.

Dixie Agricultural Society, annual fair held at Wadesboro.

Edgecombe Agricultural and Mechanical Society, fair held at Tarboro.

Carolina Fair Association, fair held at Charlotte.

New Garden fair, held at New Garden.

Cumberland County Agricultural Society, fair held at Fayetteville.

Roanoke and Tar River Agricultural Society, annual fair held at Weldon.

Eastern Carolina Agricultural and Mechanical Society, annual fair held at Rocky Mount.

Sampson County Agricultural Society, annual fair held at Clinton.

North Carolina Industrial Association (col.), annual fair held at Raleigh.

There is also a prosperous State Horticultural Society, whose annual fairs become more and more attractive. Annual fair, moveable.

Ensilage.

The experiments made in the eastern and piedmont sections to preserve forage crops in silos have been uniformly satisfactory. Large quantities of corn, peas, &c., have been kept for more than a year in good condition. Ensilage is growing in favor, and will form an important factor in stock raising and dairying. It supplies those sections not specially adapted to growing grass with what completely supplies this deficiency, and renders it certain that little if any hay will hereafter be

brought into this State. In fact, with the advantages of a mild climate during winter, long growing seasons and a bountiful, cheap, nutritious and varied production of forage, there is every reason to believe that stock raising will be as remunerative here as in any portion of the Union.

Agricultural Products.

A statement of the agricultural products of the State will be found on the following pages. The table, however, embraces only the principal products.

An examination of the census tables will show the notable fact that almost every crop produced in the United States is found in one region or another of this State, so that the widest diversification of industries is practicable.

PRINCIPAL AGRICULTURAL PRO-

COUNTIES.	COTTON.		INDIAN CORN.		OATS.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.
The State.....	893,153	389,598	2,305,419	28,019,839	500,415	3,838,068
Alamance	211	91	24,628	305,874	9,618	48,869
Alexander	617	182	16,789	212,382	7,503	51,752
Alleghany			7,210	122,587	1,933	19,365
Anson.....	28,296	11,857	29,121	305,139	8,999	72,454
Ashe			15,616	277,027	3,357	37,955
Beaufort.....	11,785	6,021	20,225	286,211	1,396	18,436
Bertie	19,455	7,290	37,735	345,091	2,403	20,517
Bladen	1,618	683	21,556	188,208	362	3,795
Brunswick.....	385	244	4,915	46,329	240	2,262
Buncombe.....			29,108	490,544	6,967	62,679
Burke.....	752	361	22,613	325,656	3,455	21,762
Cabarrus	19,224	7,467	26,831	381,321	7,592	54,519
Caldwell	30	12	17,315	274,495	3,886	30,592
Camden.....	2,670	823	23,663	294,447	1,088	8,854
Carteret.....	2,936	1,014	5,156	41,458	107	1,122
Caswell	6	4	25,663	361,641	14,441	101,398
Catawba	5,175	2,012	21,248	358,210	7,566	64,236
Chatham	13,478	5,858	43,087	558,281	19,861	120,341
Cherokee.....			14,507	227,650	1,534	11,657
Chowan	6,047	2,223	13,877	143,156	791	6,888
Clay			7,810	113,462	1,230	7,607
Cleveland	19,238	6,126	31,339	390,281	10,999	62,211
Columbus.....	2,113	930	15,723	136,546	207	2,517
Craven	12,838	5,782	19,001	218,256	333	4,426
Cumberland.....	9,210	3,905	32,677	282,423	1,509	13,791
Currituck	316	139	23,310	324,819	267	2,734
Dare.....	16	8	956	11,205	17	230
Davidson	3,779	1,553	36,983	549,906	16,924	122,063
Davie.....	790	302	22,125	438,595	13,366	139,126
Duplin.....	9,654	4,499	36,813	330,437	433	6,132
Edgecombe.....	51,880	26,250	46,235	433,214	9,589	94,021
Forsyth	16	10	20,920	335,164	11,780	95,304
Franklin.....	30,274	12,938	32,642	338,239	5,560	45,812
Gaston	10,949	4,588	24,678	373,472	6,699	50,244
Gates	5,707	1,863	21,946	170,642	1,210	10,016
Graham			4,222	66,992	628	3,914
Granville.....	6,559	2,535	42,608	515,159	14,344	110,690
Greene	16,988	8,020	25,148	173,421	1,738	16,772
Guilford.....	283	114	39,790	519,185	20,774	129,723
Halifax	432,206	16,661	44,790	437,321	4,497	41,771

DUCTS OF NORTH CAROLINA.

RICE.		RYE.		TOBACCO.		WHEAT.	
Acres.	Pounds.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.
10,846	5,609,191	61,953	285,160	57,208	26,986,213	646,829	3,391,398
.....	.....	149	619	1,688	695,013	18,661	82,163
.....	.....	760	2,445	28	11,799	6,376	35,338
.....	.....	3,121	17,638	8	2,049	1,760	10,291
.....	.....	179	574	11	4,880	5,969	25,846
.....	.....	4,685	33,809	60	11,064	5,473	39,407
979	502,676	16	94	17	5,263	374	2,736
.....	.....	33	191	4	554	309	2,189
473	140,340	261	756	6	1,040	109	521
1,489	1,163,852	127	616	7	2,502	8	70
.....	.....	2,966	12,707	947	475,428	17,501	84,974
8	4,308	1,054	4,009	58	20,079	10,016	49,338
.....	.....	75	355	14	3,239	17,550	84,656
2	1,649	684	2,855	75	25,384	8,211	42,513
86	16,861	5	30	.....	.....	461	4,428
413	206,965	85	264	1	303	418	2,090
.....	.....	53	346	10,174	4,336,604	10,841	58,137
.....	.....	181	783	49	26,388	15,054	104,770
.....	.....	63	328	141	49,837	28,900	122,760
.....	.....	1,126	4,781	42	8,411	4,317	47,898
.....	.....	.....	.....	1	398	622	4,357
.....	.....	854	3,562	25	5,771	3,282	13,093
1	835	210	875	23	5,122	11,116	55,983
1,201	642,042	128	301	15	3,866	38	223
438	251,108	79	847	6	2,732	235	1,533
12	19,963	1,513	4,343	.....	.....	1,141	7,494
58	7,727	15	75	.....	.....	101	892
7	2,780	.....	.....	.....	.....	25	167
.....	.....	277	1,414	484	260,538	32,195	174,671
.....	.....	444	1,986	1,205	633,339	13,244	71,127
620	300,203	422	1,931	16	4,655	1,031	6,292
17	2,901	139	711	3	550	2,422	16,712
.....	.....	492	1,968	1,693	822,788	13,590	77,082
.....	.....	229	961	118	58,932	8,362	45,504
.....	.....	64	265	7	2,180	11,566	62,860
.....	.....	.....	.....	3	620	718	4,187
.....	.....	566	2,126	4	1,095	718	2,919
.....	.....	64	360	8,941	4,606,358	14,428	90,764
35	19,214	394	1,909	8	1,955	3,638	19,302
.....	.....	354	1,725	910	422,716	27,743	127,214
.....	.....	123	520	21	8,487	1,300	9,235

PRINCIPAL AGRICULTURAL PRODUCTS

COUNTIES.	COTTON.		INDIAN CORN.		OATS.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.
Harnett.....	9,281	3,627	21,244	180,458	1,202	7,640
Haywood.....			17,254	314,446	4,099	35,834
Henderson.....	10	4	16,407	227,411	2,908	23,087
Hertford.....	14,605	6,360	25,521	236,088	1,800	14,512
Hyde.....	2,513	718	21,632	243,623	1,354	18,400
Iredell.....	11,603	1,657	39,264	588,220	17,488	129,429
Jackson.....	16	6	12,793	188,521	1,521	9,440
Johnston.....	32,193	15,151	45,045	428,996	3,176	29,958
Jones.....	8,463	4,078	19,425	186,954	155	5,426
Lenoir.....	19,150	8,235	29,838	274,010	1,060	12,217
Lincoln.....	7,112	2,945	19,338	313,907	6,313	41,939
McDowell.....	23	9	17,675	265,934	1,690	13,141
Macon.....			14,423	222,855	1,621	12,209
Madison.....	12	4	17,816	348,858	4,238	38,816
Martin.....	13,444	6,383	24,209	227,445	1,447	11,229
Mecklenburg.....	41,343	19,129	41,285	539,385	12,949	94,356
Mitchell.....	15	6	11,894	209,131	3,090	40,845
Montgomery.....	6,519	2,989	18,090	210,521	7,852	50,248
Moore.....	8,882	3,988	27,934	302,196	7,924	48,744
Nash.....	25,768	12,567	32,490	295,619	3,875	30,135
New Hanover.....	142	66	2,008	15,937	86	606
Northampton.....	36,219	13,616	45,224	431,581	4,805	45,769
Onslow.....	6,658	2,841	23,259	185,919	96	1,280
Orange.....	5,290	1,919	28,542	366,640	12,243	86,268
Pamlico.....	4,585	2,226	6,381	107,950	378	4,845
Pasquotank.....	4,004	1,181	28,525	348,119	1,930	17,438
Pender.....	1,463	835	16,550	159,064	183	2,209
Perquimans.....	7,925	2,778	21,910	292,850	1,222	13,921
Person.....	2	1	19,372	241,523	9,821	56,926
Pitt.....	31,147	14,879	16,482	458,166	3,301	29,406
Polk.....	1,646	362	10,632	139,315	877	5,786
Randolph.....	595	295	35,338	477,168	13,524	88,380
Richmond.....	35,198	12,754	29,502	277,974	3,571	32,279
Robeson.....	21,607	8,846	49,961	360,128	2,814	22,845
Rockingham.....	5	3	25,175	392,767	15,200	139,260
Rowan.....	10,645	1,381	38,963	597,519	17,751	142,121
Rutherford.....	9,679	2,079	32,783	394,062	6,166	31,971
Sampson.....	15,346	6,291	53,951	486,768	654	6,297
Stanly.....	5,878	2,475	22,426	271,877	10,975	72,223
Stokes.....	13	7	19,969	338,781	8,408	72,391
Surry.....	3	1	25,334	397,143	9,199	79,737
Swain.....			6,809	100,543	757	4,301

OF NORTH CAROLINA.—CONTINUED.

RICE.		RYE.		TOBACCO.		WHEAT.	
Acres.	Pounds.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.
1	830	48	1,257	32	9,510	2,393	10,957
.....	.....	757	4,383	100	39,516	10,054	56,587
.....	.....	3,734	16,351	29	1,087	2,598	12,295
.....	.....	112	334	7	2,160	817	6,891
1,016	304,671	14	133	1	517	1,079	8,949
.....	.....	359	1,581	465	242,714	17,476	88,056
.....	.....	1,583	7,878	21	4,801	4,217	21,801
36	19,672	324	1,032	36	12,881	3,711	25,111
321	118,777	245	1,210	1	250	429	2,588
208	95,559	685	2,460	45	13,500	5,067	32,800
1	1,230	28	155	15	6,085	10,159	65,949
2	515	1,360	5,016	100	30,541	6,397	32,903
.....	.....	1,823	8,734	46	9,154	5,565	27,038
.....	.....	816	1,641	1,626	807,911	7,702	40,192
11	3,150	25	151	1	211	940	6,251
.....	.....	78	403	10	2,291	12,295	66,767
.....	.....	1,358	9,021	77	29,647	3,374	19,725
.....	.....	130	425	54	14,370	9,197	39,702
.....	.....	1,512	3,954	70	15,724	11,242	45,413
.....	.....	85	336	27	7,562	3,787	27,560
315	260,068	.....	.....	.....	.....	.....	.....
.....	.....	55	448	36	20,484	1,725	14,193
159	92,565	31	65	2	730	.....	.....
.....	.....	39	208	2,323	1,178,732	18,358	96,006
394	276,174	.....	.....	12	1,520	285	2,101
2	810	13	98	.....	.....	3,300	22,453
392	248,622	14	46	3	690	7	28
3	2,090	30	259	1	400	2,957	25,514
.....	.....	13	86	5,868	3,012,387	8,974	51,935
161	110,067	284	1,394	3	598	3,787	22,664
.....	.....	606	2,680	4	931	1,896	9,516
.....	.....	148	729	45	11,101	29,443	137,104
38	17,460	942	2,338	6	1,305	3,751	19,994
303	181,393	1,548	3,952	2	577	875	6,153
.....	.....	301	1,381	9,332	4,341,250	11,298	71,187
.....	.....	253	1,134	216	115,251	24,195	138,278
1	609	689	2,438	38	12,908	8,683	39,085
441	240,086	109	2,086	28	14,352	1,249	7,970
.....	.....	89	497	8	1,735	16,465	70,070
.....	.....	1,193	5,023	4,690	2,131,161	9,374	55,284
.....	.....	3,027	10,482	2,136	905,250	9,823	42,046
.....	.....	515	2,259	11	1,166	1,173	6,578

PRINCIPAL AGRICULTURAL PRODUCTS

COUNTIES.	COTTON.		INDIAN CORN.		OATS.	
	Acres.	Bales.	Acres.	Bushels.	Acres.	Bushels.
Transylvania			9,762	154,769	257	2,870
Tyrrell	3,481	1,123	8,300	108,839	781	7,022
Union	19,090	8,336	28,877	338,520	14,357	101,719
Wake	59,916	30,115	53,172	612,869	13,948	98,962
Warren	21,603	7,778	28,457	293,773	5,559	46,090
Washington	8,117	3,524	15,824	217,631	1,065	13,427
Watauga	10	3	8,227	148,204	1,828	23,205
Wayne	32,103	14,558	44,469	466,432	1,779	18,600
Wilkes	107	29	34,865	480,089	8,240	55,360
Wilson	23,706	13,049	27,288	299,957	1,590	13,682
Yadkin	87	26	21,735	343,070	11,289	79,443
Yancey			11,200	205,659	3,657	43,631

OF NORTH CAROLINA.—CONTINUED.

RICE.		RYE.		TOBACCO.		WHEAT.	
Acres.	Pounds.	Acres.	Bushels.	Acres.	Pounds.	Acres.	Bushels.
.....	.....	3,289	16,043	10	3,853	869	3,760
503	237,515	.....	.....	.....	.....	261	2,067
.....	.....	12	67	9	3,467	12,464	49,783
.....	.....	211	1,109	230	94,354	14,783	72,341
.....	.....	39	189	1,759	992,256	5,098	37,888
87	60,873	68	380	4	685	647	5,564
.....	.....	2,387	18,850	23	7,210	2,957	22,247
567	294,201	819	2,922	198	102,979	7,041	37,195
.....	.....	5,236	17,569	110	33,211	9,515	37,696
6	1,800	73	522	17	8,745	2,804	21,115
.....	.....	821	3,723	425	177,595	10,190	48,762
.....	.....	1,290	7,647	84	33,898	3,940	21,452

WOODS AND TIMBERS.

The area of land covered with woods and timbers now standing in each of the counties of the State, as far as reported in *Hale's Woods and Timbers of North Carolina*, will be found in the table hereto annexed :

COUNTIES.	WOODED AREA.	COUNTIES.	WOODED AREA.
Alexander.....	One half.	Madison.....	Three fourths.
Anson	One third.	Mitchell.....	Three fourths.
Ashe.....	Seven tenths.	Montgomery...	Three fourths.
Bladen.....	Nine tenths.	Moore	One half.
Brunswick.....	Two thirds.	Northampton...	One half.
Camden	One half.	Onslow.....	Six tenths.
Caswell.....	One half.	Orange.....	One third.
Chatham.....	One third.	Pamlico.....	Nine tenths.
Cherokee.....	Four fifths.	Pender.....	Two thirds.
Clay	Five sixths.	Perquimans.....	One fourth.
Cleveland.....	Six tenths.	Person	One eighth.
Columbus.....	Two thirds.	Pitt.....	Three fourths.
Currituck.....	Three fifths.	Polk.....	Three fourths.
Davidson.....	Two thirds.	Randolph.....	Five sixths.
Davie.....	One third.	Richmond.....	Two thirds.
Edgecombe.....	One half.	Robeson.....	Two thirds.
Forsyth.....	One third.	Rockingham...	One third.
Gaston.....	Three fifths.	Rowan.....	One third.
Gates.....	Three fourths.	Rutherford.....	Three fourths.
Graham.....	Seven eighths.	Sampson.....	Six tenths.
Granville.....	Six tenths.	Surry.....	Three fourths.
Greene.....	One half.	Swain.....	Five sixths.
Halifax.....	Six tenths.	Tyrrell.....	Seven tenths.
Haywood.....	Four fifths.	Union.....	One third.
Iredell.....	One half.	Vance.....	One tenth.
Jackson.....	Five sixths.	Warren.....	One half.
Johnston.....	Two thirds.	Wayne.....	Four tenths.
Lincoln.....	Two thirds.	Wilson.....	Six tenths.
Macon.....	Five sixths.	Yadkin.....	One half.

The United States census for 1880 gives the amount of merchantable pine—long-leaf pine (*Pinus australis*)—standing in fifteen counties as follows:

COUNTIES.	NO. FEET.	COUNTIES.	NO. FEET.
Bladen..... ..	288,000,000	New Hanover...	96,000,000
Brunswick... ..	141,000,000	Onslow.....	34,000,000
Chatham..... ..	448,000,000	Robeson.....	864,000,000
Columbus.....	288,000,000	Sampson	602,000,000
Cumberland.....	806,000,000	Wake.....	48,000,000
Duplin.....	21,000,000	Wayne.....	40,000,000
Harnett.....	486,000,000		
Johnston.....	563,000,000	Total	5,229,000,000
Moore	504,000,000		

TAR, PITCH AND TURPENTINE.

For a long period this State has been the principal source of supply of these products.

According to the census of 1870, there were produced in that year 3,799,499 gallons of spirits of turpentine, 456,141 barrels of rosin and 300 barrels of tar. The census of 1880 gives 6,279,200 gallons of spirits of turpentine, 663,967 barrels of rosin and 80,000 barrels of tar.

The total value of the crop of naval stores was not far from \$8,000,000.

From the line of the Carolina Central and Raleigh & Augusta Air Line, there were shipped in 1885 182,000 barrels of rosin and 39,000 barrels of spirits.

From Wilmington 344,713 barrels of rosin; 70,012 barrels of spirits; 65,874 barrels of tar; 43,701 barrels of crude turpentine.

From Fayetteville about 12,000 barrels of spirits of turpentine and 40,000 barrels of rosin.

From Newbern 10,000 barrels of spirits and 2,000 barrels of tar.

SILK CULTURE.

The following notice of silk culture is from the hand of Mr. Edward Fasnach, of Raleigh, North Carolina, who speaks from a practical knowledge of the business.

Among the undeveloped resources of North Carolina there are probably none deserving of more thoughtful consideration than silk culture.

The mulberry, which supplies the food for the silk worm, is indigenous, and grows in great abundance in almost every section of the State, and it attains its fullest development with scarcely any cultivation. Nor is the silk-giving quality of its leaves less noticeable, for, wherever North Carolina grown silk has been put to a test, it has been found of most excellent quality, and equal to the best French and Italian.

There is no branch of agriculture that offers so generous a reward for so little capital invested as silk culture. The making of a crop, from the hatching to the gathering of the silk, be the crop small or large, will consume but six weeks' time. Moreover, the otherwise unemployed members of the family, as the women, the children, the aged, and even infirm, can here find profitable occupation. Nor is silk culture limited to the farm

or country, but where there is a room and food for the silk worm available, whether it be in town or city, silk can be raised. It is computed that there are 270,994 families in North Carolina; now, if only 10,000 would make a small crop each year of two hundred to three hundred pounds of silk, the aggregate income would amount to between one and two millions of dollars. Three-fourths of the silk in France is the production of small crops, from two hundred to four hundred pounds. It is a source of great wealth to that nation, and contributes more than any other branch of industry to the general prosperity of the people. The French call silk culture *une de nos gloires industrielles* (one of our industrial glories).

Our endless tracts of cheap and uncultivated lands, so well adapted to the growth of the mulberry, and our mild and equable climate, present strong inducements to French and Italian colonies of silk growers, with whom the culture of silk has become an hereditary occupation.

The rapid progress and fast increasing production of the American silk manufactories cannot but have an encouraging influence upon silk culture in this country. The raw silk imported, duty free, last year, amounted to about twelve millions of dollars.

The prices for cocoons and raw silk have of late years very much fluctuated. While the cocoons sold in 1876 at \$3.00 per pound, they are selling to-day at \$1.25. These are the extreme figures; the average price may be fairly stated at \$1.50 per pound.

Two hundred mulberry trees will grow very well on two acres of land. A good medium-sized tree will yield one hundred and fifty pounds of leaves, which will give 30,000 pounds of leaves on two acres. As it takes seventeen pounds of leaves to make one pound of fresh cocoons, 30,000 pounds will give 1,765 pounds of fresh cocoons.

The 1,765 pounds of fresh cocoons will make 588 pounds of dried cocoons.

A ready market for these cocoons can be found in Philadelphia through the medium of the Department of Agriculture.

The expenses of cultivating two acres in trees, feeding the worms, &c., may be stated as follows:

1 grown person first ten days.....	\$ 10.00
2 boys or girls " " "	6.00
3 grown persons second ten days.....	20.00
5 boys or girls " " "	15.00
3 grown persons third ten days.....	30.00
16 boys or girls " " "	38.00
	<hr/>
	\$ 129.00

If a few dollars for food is added, a few days work for pruning and cultivating the trees, and a few sundries, it would cover all the expenses, which would not exceed \$160.

FISHING INTERESTS.

The North Carolina fisheries are the most important on the South Atlantic coast. They yielded in 1880 four times as much food fish and employed three times as many persons as they did in 1870, and yet, south of Albemarle sound, they are practically undeveloped on account of lack of shipping and refrigerating conveniences. The means of shipment are increasing every year, however, and, with this advantage, the enterprise of the people along the coast will build up, at various points, a large trade in fish, such as Wilmington, Beaufort, Newbern and Washington now have.

The principal commercial fisheries are the herring, shad, bluefish, mullet, Spanish mackerel, sturgeon, menhaden, bass, trout and oyster.

The large rivers and brackish sounds of North Carolina are visited annually by immense numbers of shad and herring, and in spring and early summer the fishing is extensive in many portions of the State. The principal fisheries, however, are near the junction of the Roanoke and Chowan rivers, at the head of Albemarle sound, and in the Neuse and the Tar rivers. In the herring fisheries the State ranks first on the list, with 15,520,000 pounds, netting the fishermen \$142,847. The quantity

of shad taken in 1880 was 3,221,263 pounds, being a little below the Maryland catch, but the price realized is so much greater that the value of the catch is more than double that of the Maryland fishery, because the shad are marketed before fishing begins there. The sea fisheries, when compared with those of the more northern States, are of little importance, though, in the bays and sounds between Beaufort and Wilmington, many follow fishing for a livelihood, and secure annually large quantities of the various species. The mullet fisheries of North Carolina are second only to those of Florida, the catch in 1880 amounting to 3,368,000 pounds, valued at \$80,500.

The catch of bluefish, striped bass and trout, will average about a million pounds each per annum, and the run of these fish increases rather than diminishes.

Spanish mackerel are becoming more common along our shores. The Census Bulletin of last June estimates the number caught at ten thousand pounds, but this must be far under the real catch. Half that weight was caught during the past summer, by gentlemen fishing for sport at Beaufort and Morehead City, and these points represent a small area of the fishing grounds. The largest sturgeon and the best are caught and shipped from North Carolina waters, aggregating a million pounds in weight.

The Menhaden fisheries have variable success, according to the run of the fish. In some years the waters are alive with them, and the fishermen cannot

handle them for number, in other years the run is small, and the seasons work unfavorably to the fishermen. In 1868 the catch was 50,000 pounds at Manteo, Dare county. It fell off during the next two years, but has increased annually since, and there are now three fish oil mills at Beaufort that are supplied from these fisheries. Formerly a few were used for food, and the rest were thrown away.

There are the usual varieties of game fish and other fish that do not come under the head of commercial fish, found in the streams and ponds of all sections of the State.

The following summary represents the statistical review of the North Carolina Fisheries :

Persons employed.....	5,274
Fishing vessels.....	95
Fishing boats.....	2,714
Capital dependent on the fishery industries.....	\$506,561
Pounds of sea products taken (including oysters)...	11,357,300
Value of same.....	\$280,745
Pounds of river products taken.....	20,892,188
Value of same.....	\$546,950
Total value of products to the fishermen.....	\$827,695

The Oyster Survey.

The oyster beds of the State have grown in favor during the last few years, and consequently their product has greatly increased to supply the demand. The New

river oyster has a great local reputation, and is preferred by connoisseurs to the oysters of Virginia and Maryland. It sells for a uniform price. The total yield is 200,000 bushels.

Under a resolution of the General Assembly, the Board of Agriculture is now conducting an examination of the oyster area of the State. The survey is made under the direction of Lieut. Francis Winslow, U. S. Navy, whose experience and learning will give the results of the work great scientific as well as economic value.

The proposed plan of work is to extend the examination from Morehead City to the southward. To then extend operations from Morehead to the northward through Core, Pamlico, Albemarle and Currituck sounds.

So far the investigation has proceeded fairly well notwithstanding the inclement season of the year and the delays incidental to preparation and to all tentative operations. The survey of Bogue Sound has been completed and that of the White Oak river is well under way. The indications are that about 15,000 acres of bottom in Bogue Sound can be turned into oyster ground; or, in other words, an area now unproductive can probably be made to yield an annual crop worth over \$300,000.

German Carp.

Carp culture was begun and carried on by the Board of Agriculture for the purpose of introducing a valuable food fish. In process of time it was found that about twenty-five hundred ponds were established in the State. These being generally distributed, young carp became accessible and cheap in every section. The Board having accomplished its object, the culture of carp was ordered to be discontinued.

In 1877 the Department began the propagation and culture of fish in the inland waters of the State. The work was done under the direction of Mr. S. G. Worth, Superintendent of Fish and Fisheries, who released over 25,000,000 shad fry in the tributaries of Pamlico and Albemarle sounds, and the rivers flowing into South Carolina. The hatchery at Avoca, on Albemarle sound, was furnished with the most approved apparatus.

About a million California salmon and mountain trout were distributed in the waters of the western part of the State. The work of artificial propagation has been suspended.

Fish Oil Mills.

At Beaufort, on Beaufort harbor, are three Fish Oil Mills for expressing the oil and making fish scrap for fertilizers of the menhaden and refuse and unmarketable

fish. The offal of fish has been utilized as a fertilizer for years past on the plantations contiguous to the large fisheries on the sounds and rivers. This waste, at the Albemarle fisheries alone, thus used, is estimated at 3,000 tons per annum. When to these figures is added the refuse from the Pamlico and the smaller sounds and the rivers that empty into them, the aggregate of fertilizing material is seen to be very large. The analysis of this refuse shows a high result. The immense schools of menhaden on the coast and in the sounds attracted attention a number of years ago and desultory attempts to take them were made, but on account of extravagant equipment, want of business management and proper acquaintance with the modes of fishing in these waters, they were, as a rule, unsuccessful.

An old fisherman gives the following account of the visits of the menhaden to the eastern waters: "They first make their appearance in June and remain until December; they generally come into the shore on the northern coast of the cape, running south along the beach and entering the inlets and rivers. In the first of the season they may be seen, in moderate weather, five or six miles at sea, in large schools half a mile in length, apparently floating upon the surface of the water. They always make their appearance from the north and leave the coast by the same route. Some are seen in the sounds and rivers all the year. When the second large run occurs in the fall they appear in immense numbers. This is sometimes in November and in other seasons in December. Many schools may be seen at one time.

They seldom come near the coast in high winds and rough seas, or if they do they swim so low that they are not seen from land. Their appearance is certain, and they are about the same in abundance every year at the spring run, but the fall and winter runs vary somewhat, the number in some seasons being very much smaller."

The sources of material for the manufacture of commercial fertilizers are sought for to keep pace with their use, and as these fish are especially valuable for producing ammonia, the demand for them will increase from year to year. The points to which preference will be given for the establishment of factories are those where they will be found in greatest abundance. On the eastern waters of the State are many such points, notably Roanoke Island. It is almost equally accessible to Albemarle and Pamlico sounds, the great headquarters of the menhaden, and near the great fisheries where a large supply of offal can annually be had. It has unlimited facilities for the transportation of its products by sea and by land from Edenton, Elizabeth City, Newbern, Washington and Morehead City.

Indications are that fishing for material for fish oil mills will become one of the steady and profitable pursuits of the eastern section.

In 1880 there was a fish oil factory at Manteo, on Roanoke Island. During the summer of 1882 the three now in operation in Carteret county, near Beaufort, were established. In one of these engines with 48 horse power are used in running machinery and pumps. There are seventeen cooking tanks, holding twenty barrels of

fish each, two presses, four curbs, two pumps and a hoisting engine for unloading boats. Two acres of ground are covered with boards for drying scrap. The scrap house is 40x60 feet. The factory is 50x60 feet, with sheds and engines and boiler houses attached. There is a good dock 46x60 feet, with twelve feet of water. A steamer and sail vessels and boats are used for catching fish, which are taken in purse nets. The number of hands employed is thirty-three, and the capacity of the works is six hundred barrels of fish per day.

Of another establishment the daily capacity is five hundred barrels of menhaden. The fish are mostly caught with purse seines, but large quantities are bought from fishermen, who use the ordinary hauling seines and set-nets. During the fishing season there are employed at the works, on the seines and on the freight boats, from thirty-five to fifty men, at wages ranging from \$17.00 to \$40.00 per month. In addition to the regular employes, there are seventy-five or one hundred men engaged in catching fish in their own nets, which they sell to this establishment.

There is another steam factory, with hydraulic presses, in operation, but its capacity has not been ascertained.

There are also four small works, with caldrons for cooking the fish and handpresses for pressing the oil from them.

This industry will give employment from the first of April to the last of November to four hundred men, at good wages, and will yield \$150,000 per annum when there is a good catch of fish.

NEWSPAPERS IN THE STATE.

STANLY OBSERVER.....	Albemarle.
COURIER	Ashboro.
CITIZEN	Asheville.
ADVANCE	Asheville.
BLUE RIDGE BAPTIST.....	Asheville.
MOUNTAIN VOICE.....	Bakersville.
WESTERN DEMOCRAT.....	Bakersville.
GAZETTE	Carthage.
TIMES.....	Chadbourn.
UNIVERSITY MONTHLY	Chapel Hill.
BUD.	Clayton.
OBSERVER.....	Charlotte.
HOME-DEMOCRAT.....	Charlotte.
METHODIST ADVANCE.....	Charlotte.
CHURCH MESSENGER.....	Charlotte.
EVENING CHRONICLE.....	Charlotte.
CAUCASIAN	Clinton.
TIMES	Concord.
REGISTER.....	Concord.
CURRENT.....	Dallas.
THE COLLEGE STUDENT.....	Dallas.
MONTHLY	Davidson College.
RECORDER	Durham.
TOBACCO PLANT.....	Durham.
REPORTER	Durham.
TIMES	Durham.
REPORTER AND POST.	Danbury.
ENQUIRER	Edenton.

CAROLINIAN	Elizabeth City.
FALCON	Elizabeth City.
ECONOMIST.....	Elizabeth City.
BLADEN BULLETIN.....	Elizabethtown.
OBSERVER AND GAZETTE.....	Fayetteville.
NEWS	Fayetteville.
WEEKLY.....	Franklinton.
GAZETTE.....	Gastonia.
ENTERPRISE.....	Germanton.
MESSENGER.	Goldsboro.
ARGUS	Goldsboro.
GLEANER	Graham.
PATRIOT	Greensboro.
WORKMAN.....	Greensboro.
NEW NORTH STATE.....	Greensboro.
CENTRAL PROTESTANT.....	Greensboro.
REFLECTOR.....	Greenville.
DEMOCRATIC STANDARD.....	Greenville.
GOLD LEAF.....	Henderson.
SOUTHERN WOMAN.....	Henderson.
PRESS.....	Hickory.
WESTERN CAROLINIAN.....	Hickory.
HIGHLANDER	Highlands.
ENTERPRISE	High Point.
OBSERVER.....	Hillsboro.
NEWS	Kernersville.
FREE PRESS.....	Kinston.
CADET.....	LaGrange.
EXCHANGE	Laurinburg.
DAN VALLEY ECHO... ..	Leaksville.
TOPIC	Lenoir.
CHRONICLE	Lenoir.
DISPATCH	Lexington.
PRESS.....	Lincolnton.
TIMES.....	Louisburg.
RATTLER	Louisburg.

ROBESONIAN	Lumberton.
BUGLE	Marion.
CHRONICLE	Milton.
ADVERTISER	Milton.
TIMES.....	Mocksville.
ENQUIRER AND EXPRESS.....	Monroe.
STAR	Morganton.
NEWS	Mt. Airy.
BULLETIN ..	Murphy.
INDEX	Murfreesboro.
JOURNAL.....	Newbern.
FREE WILL BAPTIST.	Newbern.
PEOPLE'S ADVOCATE.....	Newbern.
ENTERPRISE	Newton.
TORCHLIGHT	Oxford.
ORPHANS' FRIEND.....	Oxford.
OAK LEAF.....	Oak Ridge.
RECORD	Pittsboro.
HOME	Pittsboro.
ROANOKE PATRON.....	Potecasi.
NEWS AND OBSERVER.....	Raleigh.
EVENING VISITOR.....	Raleigh.
REGISTER.....	Raleigh.
STATE CHRONICLE	Raleigh.
BIBLICAL RECORDER.....	Raleigh.
CHRISTIAN ADVOCATE.....	Raleigh.
CHRISTIAN SUN.....	Raleigh.
SPIRIT OF THE AGE.....	Raleigh.
NORTH CAROLINA TEACHER.....	Raleigh.
NORTH CAROLINA FARMER.....	Raleigh.
ST. MARY'S MUSE.....	Raleigh.
TIMES.	Reidsville.
DOLLAR WEEKLY.....	Reidsville.
ROCKET	Rockingham.
SPIRIT OF THE SOUTH.....	Rockingham.
REPORTER.....	Rocky Mount.

TAR RIVER TALKER.....	Rocky Mount.
ENTERPRISE	Rutherford College.
PERSON COUNTY COURIER.....	Roxboro.
BANNER	Rutherfordton.
PEOPLE'S PRESS.....	Salem.
CAROLINA WATCHMAN.....	Salisbury.
HERALD	Salisbury.
DEMOCRAT.....	Salisbury.
TELEGRAPH	Snow Hill.
DEMOCRAT.....	Scotland Neck.
AURORA	Shelby.
NEW ERA	Shelby.
HERALD	Smithfield.
LANDMARK	Statesville.
AMERICAN	Statesville.
CHRISTIAN ADVOCATE.....	Statesville.
PAMLICO ENTERPRISE.....	Bayboro.
SOUTHERNER	Tarboro.
SENTINEL.....	Tarboro.
GUIDE.....	Tarboro.
TRINITY MAGAZINE.....	Trinity.
MONTGOMERY VIDETTE.....	Troy.
ANSON TIMES.....	Wadesboro.
INTELLIGENCER.....	Wadesboro.
GAZETTE	Warrenton.
GAZETTE	Washington.
WATCHTOWER	Washington.
REVEILLE	Washington.
BANNER	Washington.
PROGRESS.....	Washington.
NEWS	Weldon.
NEWS	Waynesville.
STAR	Wilmington.
REVIEW	Wilmington.
NORTH CAROLINA MEDICAL JOURNAL.....	Wilmington.
NORTH CAROLINA PRESBYTERIAN.....	Wilmington.

POST	Wilmington.
JOURNAL	Wilmington.
AFRICO-AMERICO PRESBYTERIAN.....	Wilmington.
ADVANCE	Wilson.
MIRROR.....	Wilson.
ZION'S LANDMARK.....	Wilson.
UNION REPUBLICAN.....	Winston.
SENTINEL.....	Winston.
TWIN CITY DAILY.....	Winston.
PILOT	Winston.
PROGRESSIVE FARMER.....	Winston.
STUDENT	Wake Forest.

COMMERCIAL FACILITIES.

Railroads in North Carolina in 1886.

ALBEMARLE AND RALEIGH, between Williamston and Tarboro.

ALMA AND LITTLE ROCK, bet. Alma and Little Rock.

ABBOTTSBURG AND NEWBURG, bet. Abbottsburg and Newburg.

ASHEVILLE AND SPARTANBURG, bet. Asheville, N. C. and Spartanburg, S. C.

ATLANTA AND CHARLOTTE AIR-LINE, bet. Charlotte, N. C., and Atlanta, Ga.

ATLANTIC AND NORTH CAROLINA, bet. Goldsboro and Morehead City.

ATLANTIC, TENNESSEE AND OHIO, bet. Charlotte and Statesville.

CAPE FEAR AND YADKIN VALLEY, bet. Bennettsville, S. C. and Dalton, N. C.

CAROLINA CENTRAL, bet. Wilmington and Shelby.

CHADBOURN AND CONWAYBORO, bet. Chadbourn, N. C., and Conwayboro, S. C.

CHERAW AND WADESBORO, bet. Cheraw, S. C., and Wadesboro, N. C.

CHARLOTTE, COLUMBIA AND AUGUSTA, bet. Charlotte, N. C., and Augusta, Ga.

CHESTER AND LENOIR, bet. Lenoir, N. C., and Chester, S. C.

CLINTON AND WARSAW, bet. Clinton and Warsaw.

DANVILLE, MOCKSVILLE AND SOUTHWESTERN, bet. Danville, Va., and Leaksville, N. C.

EAST TENNESSEE AND WESTERN N. C., bet. Johnson City, Tenn., and Cranberry, N. C.

ELIZABETH CITY AND NORFOLK, bet. Edenton, N. C., and Norfolk, Va.

HALIFAX AND SCOTLAND NECK, bet. Halifax and Hill's Ferry.

JAMESVILLE AND WASHINGTON, bet. Jamesville and Washington.

HAMLET AND GIBSON, bet. Hamlet and Gibson.

LOUISBURG AND FRANKLINTON, bet. Louisburg and Franklinton.

MILTON AND SUTHERLIN, bet. Milton, N. C., and Sutherlin, Va.

NASHVILLE AND ROCKY MOUNT, bet. Nashville and Rocky Mount.

NORTH CAROLINA, bet. Goldsboro and Charlotte.

NORTHWESTERN NORTH CAROLINA, bet. Greensboro and Salem.

NORTH CAROLINA MIDLAND, bet. Goldsboro and Smithfield.

OXFORD AND HENDERSON, bet. Oxford and Henderson.

PETERSBURG, bet. Petersburg, Va., and Weldon, N. C.

PIEDMONT, bet. Greensboro, N. C., and Danville, Va.

PITTSBORO AND MONCURE, bet. Pittsboro and Moncure.

RALEIGH AND AUGUSTA AIR-LINE, bet. Raleigh and Hamlet.

RALEIGH AND GASTON, bet. Raleigh and Weldon.

SEABOARD AND ROANOKE, bet. Portsmouth, Va., and Weldon, N. C.

TARBORO BRANCH, bet. Rocky Mount and Tarboro.

UNIVERSITY, bet. University Station and Chapel Hill.

WILMINGTON AND WELDON, bet. Wilmington and Weldon.

WILMINGTON, COLUMBIA AND AUGUSTA, bet. Wilmington, N. C., and Columbia, S. C.

WESTERN NORTH CAROLINA, bet. Salisbury and Paint Rock and Jarrett's.

WILSON AND FAYETTEVILLE, bet. Wilson and Fayetteville.

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Inland Steamboat Navigation.

There are eleven hundred miles of inland steamboat navigation in North Carolina.

Ocean steamers of large burden come into Wilmington and Beaufort, and the Old Dominion and Clyde lines of coastwise steamers come to Newbern, Elizabeth City and Washington *via* the Albemarle and Chesapeake Canal. The sounds are navigated by a large fleet of light-draft and fast steamboats that furnish abundant means of transportation for passengers and freight between the numerous points where they touch.

Steamboats run up the Chowan and Blackwater to Franklin, Va., and up the Meherrin to Murfreesboro; up the Roanoke to Halifax; up the Neuse to Kinston; up the Trent to Trenton; up the Cape Fear to Fayetteville; up the Tar to Tarboro; up the Scuppernong to Creswell; up the Alligator to Fairfield; up the Cashie to Windsor; up the Perquimans river to Belvidere; up the Little river to Woodville; up the Pasquotank many miles above Elizabeth City; up North river to Indian township, and up Contentnea and Swift creeks to the head of navigation.

POPULATION.

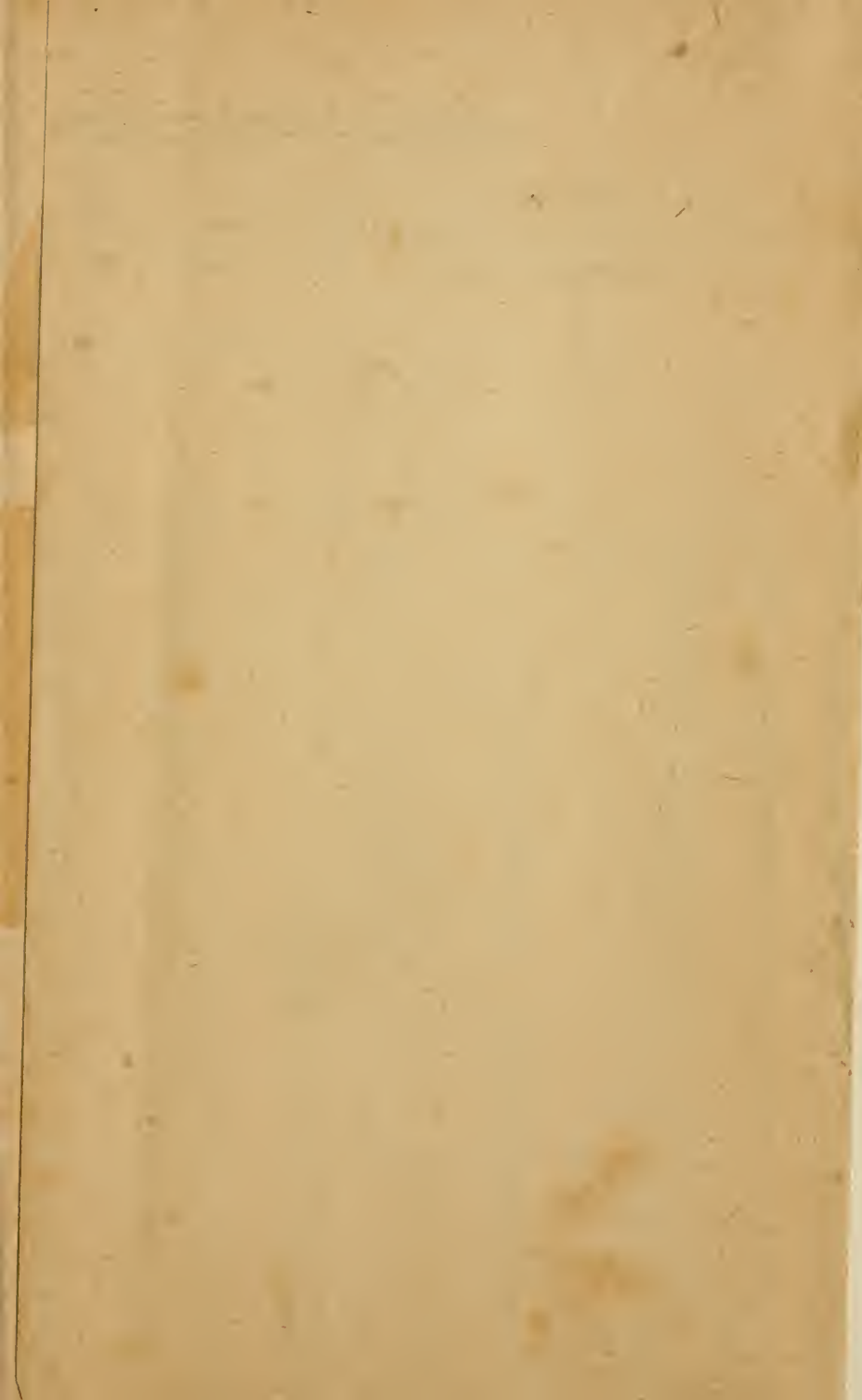
The following statement shows the population and area of each county in North Carolina, according to the census of 1880.

In the column entitled "colored" are included the very few Chinese, Japanese and Indians.

COUNTIES.	Population.			Square Miles.
	Total.	White.	Colored.	
The State.....	1,399,750	867,242	532,508	48,580
Alamance	14,613	9,997	4,616	430
Alexander.....	8,355	7,458	897	300
Alleghany	5,486	4,967	519	300
Anson	17,994	8,790	9,204	500
Ashe	14,437	13,471	966	450
Beaufort.....	17,474	10,022	7,452	720
Bertie.....	16,399	6,815	9,584	720
Bladen	16,158	7,598	8,560	900
Brunswick.....	9,389	5,337	4,052	950
Buncombe	21,909	18,422	3,487	620
Burke.....	12,809	10,088	2,721	400
Cabarrus.....	14,964	9,849	5,115	400
Caldwell.....	10,291	8,691	1,600	450
Camden.....	6,274	3,791	2,483	280
Carteret.....	9,784	7,107	2,677	520
Caswell	17,825	7,169	10,656	400
Catawba.....	14,946	12,469	2,477	370

COUNTIES.	Population.			Square Miles.
	Total.	White.	Colored.	
Mitchell.....	9,435	8,932	503	240
Montgomery	9,374	6,857	2,517	570
Moore	16,821	11,485	5,336	800
Nash	17,731	9,417	8,314	520
New Hanover.....	21,376	8,159	13,217	80
Northampton.....	20,032	7,987	12,045	510
Onslow.....	9,829	6,600	3,229	640
Orange.....	23,698	14,555	9,143	670
Pamlico	6,323	4,207	2,116	860
Pasquotank	10,369	4,855	5,514	240
Pender	12,468	5,509	6,959	800
Perquimans	9,466	4,795	4,671	220
Person.....	13,719	7,206	6,513	460
Pitt.....	21,794	10,704	11,090	820
Polk	5,062	3,918	1,144	300
Randolph	20,836	17,758	3,078	720
Richmond	18,245	8,141	10,104	860
Robeson ..	23,880	11,942	11,938	950
Rockingham	21,744	12,431	9,313	550
Rowan ..	19,965	13,621	6,344	450
Rutherford	15,198	11,910	3,288	470
Sampson	22,894	13,347	9,547	840
Stanly	10,505	9,166	1,339	380
Stokes	15,353	11,730	3,623	500
Surry	15,302	13,227	2,075	500
Swain	3,784	3,234	550	420
Transylvania	5,340	4,823	517	330
Tyrrell.....	4,545	3,110	1,435	320
Union.....	18,056	13,520	4,536	640
Wake	47,939	24,289	23,650	950
Warren.....	22,619	6,386	16,233	450
Washington.....	8,928	4,554	4,374	350
Watauga.....	8,160	7,746	414	460
Wayne.....	24,951	12,827	12,124	500
Wilkes.....	19,181	17,257	1,924	700
Wilson	16,064	8,655	7,409	350
Yadkin	12,420	10,876	1,544	320
Yancey.....	7,694	7,369	325	400

COUNTIES.	Population.			Square Miles.
	Total.	White.	Colored.	
Chatham.....	23,453	15,500	7,953	800
Cherokee.....	8,182	7,796	386	500
Chowan.....	7,900	3,633	4,267	240
Clay.....	3,316	3,175	141	160
Cleveland.....	16,571	13,700	2,871	420
Columbus.....	14,439	8,926	5,513	750
Craven.....	19,729	6,664	13,065	900
Cumberland.....	23,836	12,594	11,242	900
Currituck.....	6,476	4,495	1,981	200
Dare.....	3,243	2,875	368	270
Davidson.....	20,333	16,341	3,992	600
Davie.....	11,096	7,770	3,326	300
Duplin.....	18,773	10,587	8,186	670
Edgecombe.....	26,181	7,968	18,213	500
Forsyth.....	18,070	13,441	4,629	340
Franklin.....	20,829	9,476	11,353	420
Gaston.....	14,254	10,188	4,066	340
Gates.....	8,897	4,973	3,924	360
Graham.....	2,335	2,123	212	250
Granville.....	31,286	13,603	17,683	750
Greene.....	10,037	4,652	5,385	300
Guilford.....	23,585	16,885	6,700	680
Halifax.....	30,300	9,137	21,163	680
Harnett.....	10,862	7,092	3,770	540
Haywood.....	10,271	9,787	484	740
Henderson.....	10,281	8,893	1,388	360
Hertford.....	11,843	5,122	6,721	340
Hyde.....	7,765	4,424	3,341	430
Iredell.....	22,675	16,752	5,923	600
Jackson.....	7,343	6,591	752	920
Johnston.....	23,461	15,996	7,465	670
Jones.....	7,491	3,212	4,279	450
Lenoir.....	15,344	7,277	8,067	420
Lincoln.....	11,061	8,180	2,881	270
McDowell.....	9,836	7,939	1,897	440
Macon.....	8,064	7,395	669	650
Madison.....	12,810	12,351	459	450
Martin.....	13,140	6,661	6,479	500
Mecklenburg.....	34,175	17,922	16,253	680



AGGREGATE VALUE OF LAND AND TOWN

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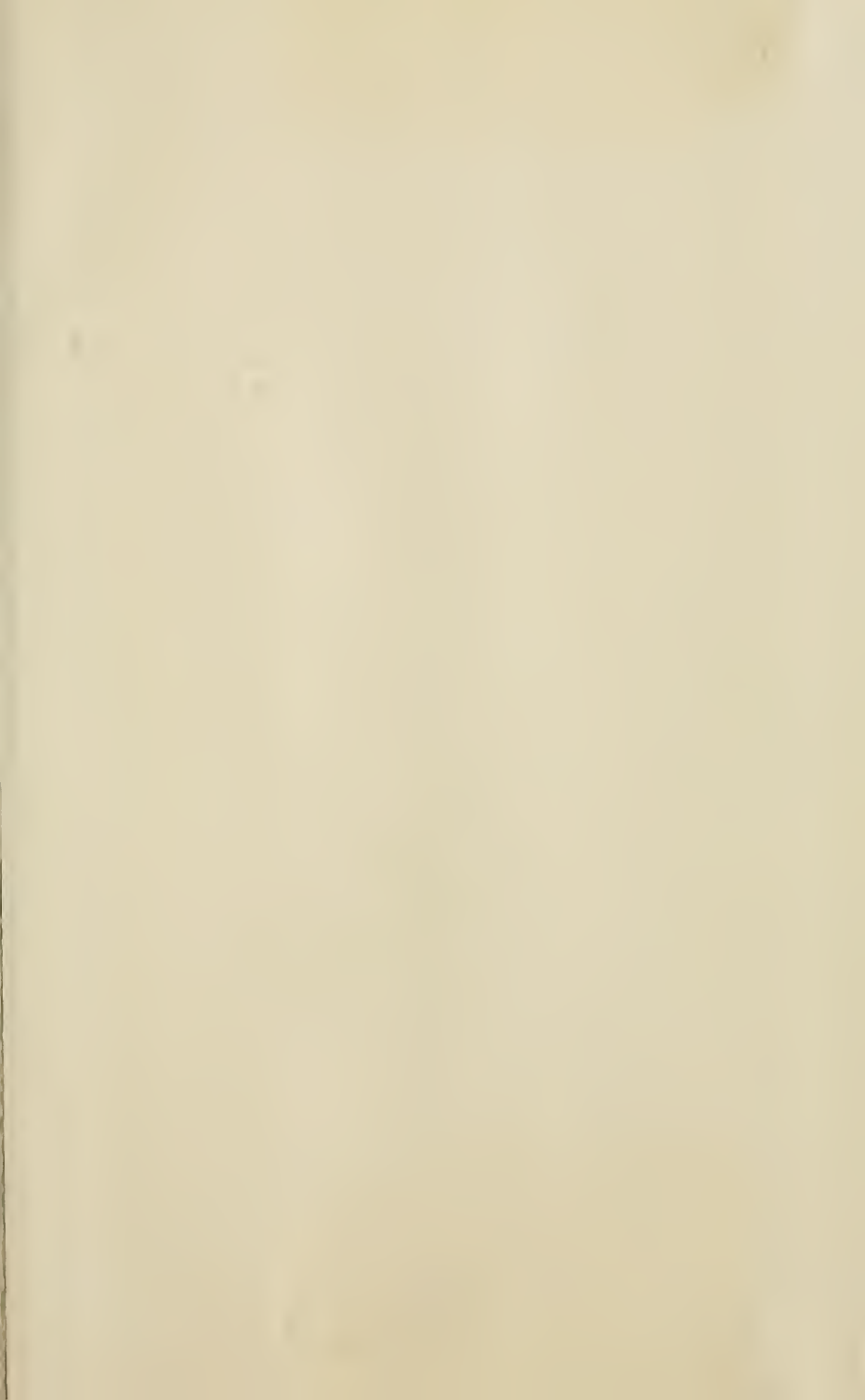
Pender,	5,895	6,018	1	12,913
Perquimans,	4,687	4,606	..	9,293
Person,	8,193	6,958	..	15,151
Pitt,	13,052	12,466	1	25,519
	4,792	1,108	2	5,902
	21,831	2,224		

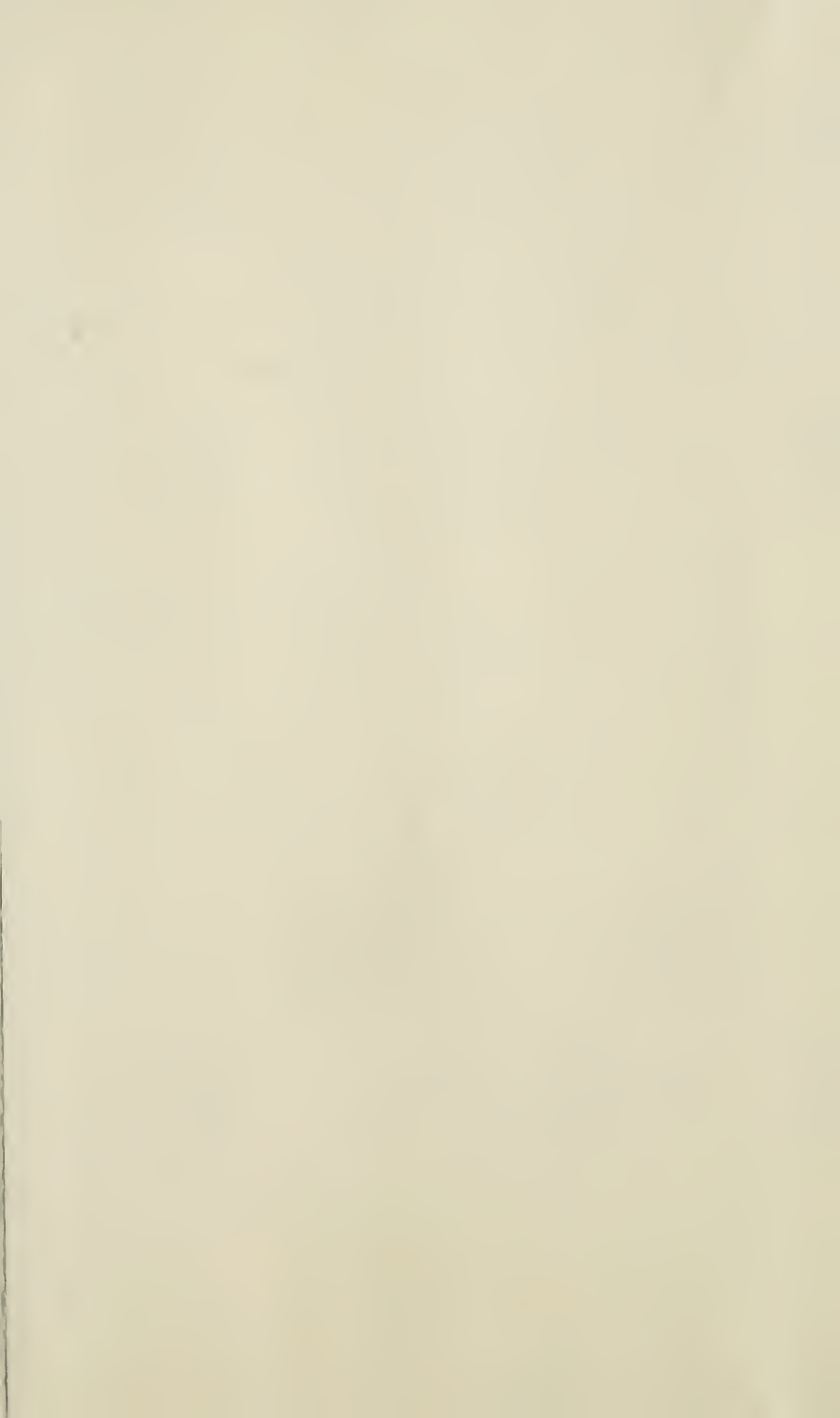
New H.
Pasquotank
Surry
Wayne

Total

15

[There is one Chipaman in W
county who is not enumerated in
above list. This is one of PORTER'S
uraces.—EDITOR.]









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